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NEWSPAPER

News Update

Comments Move Ansi To Enhance Fortran

WASHINGTON, D.C. – Four statements have been added to the draft of the proposed Fortran standard revision and "together [they] provide the capability to conditionally execute groups of statements," according to a spokesman for American National Standards Institute's (Ansi) X3J3 committee.

The need for the facilities supported by the block IF, ELSE IF, ELSE and END IF statements "was strongly presented" in many of the comments received since X3J3's proposal was released for public review earlier this year [CW, April 12], the committee said.

By mid-July, 200 letters totaling 810 pages had been received and the overwhelming majority were favorable, the spokesman added.

According to Ansi procedures, each suggestion is being evaluated to determine if a change should be made in the draft standard.

The committee will continue its review of public comments at its next meeting in September. The public review and comment period closes Sept. 28.

Stay Lets Ill. Banks Continue With CBCTs

CHICAGO – Yet another page in the story of electronic funds transfer has slowly been turned.

U.S. Supreme Court Judge John Paul Stevens has issued a stay order permitting Continental Illinois National Bank and Trust Co. and the First National Bank of Chicago to continue operating their customer-bank communications terminals (CBCT) until the Supreme Court decides whether to hear their case.

The two Illinois banks are appealing an earlier U.S. Court of Appeals ruling that CBCTs constitute branch banks, which are illegal under Illinois law [CW, July 5].

In related legislation, the City of Chicago council passed a Community Bank Ordinance sponsored by Mayor Richard J. Daley.

The bill, passed under a home-rule measure, would permit Chicago banks to open six community offices and operate an unlimited number of automatic tellers.

Continental and First National have filed in Cook County Circuit Court to have the city ordinance declared constitutional.

At the same time, the Illinois Bankers Association has filed to have it declared unconstitutional.

No dates have been set for court hearings.

Worth the Court Battles?

IBM Admits Many Papers Not Privileged

By Edith Holmes
Of the CW Staff

NEW YORK – They've been fought over from district court to appeals court, but many of them weren't worth the fight, it now appears.

"They" are the 20,000 documents IBM has been trying to keep out of the hands of the Justice Department, which is currently trying the U.S. government's antitrust case against the firm.

Between 30% and 40% of those documents are either not privileged – as IBM had claimed – or are so old or of such little consequence they can be turned over to the government immediately, IBM attorneys said last week.

Following the denial of an IBM request for protection of the documents by the U.S. Second Circuit Court of Appeals here recently [CW, July 26], lead IBM attorney Thomas D. Barr reviewed the documents and found as many as 8,000 did not require any protection, he told the court last week.

Barr told Judge David N. Edelstein another 50% to 60% of the documents could be dealt with through a protective order that would proscribe how the government handled the documents once they were turned over by the company.

Only 10% of the 20,000 documents IBM has claimed as privileged in this latest round would require review and a ruling by the judge to determine whether they were materials that fall into the category of privileged documents.

An Ongoing Battle

The battle over privileged documents has gone on since before the now-14-month-old trial ever started.

In an earlier brouhaha, IBM claimed another group of around 20,000 documents were covered by the attorney-client privilege. These documents had "inadvertently" been turned over to Control Data Corp. when it was preparing its case against IBM, IBM said, contending they should not have to be turned over to the government.

On that occasion, Edelstein ordered the firm to turn the documents over and fined the firm $150,000 per day for contempt for not relinquishing the documents.

IBM appealed that decision all the way to the Supreme Court, but was rebuffed and turned the documents over to the Justice Department. The Supreme Court did not rule whether the documents were privileged, but rather said IBM should wait to raise such issues until after the entire case was over.

On almost all of the documents in question, IBM had contended they were specifically written to help guide the lawyers in preparing for this or other cases or that

(Continued on Page 4)

Survey Shows 55% of Consumers Oppose Bell-Backed Reform Act

By Ronald A. Frank
Of the CW Staff

CAMBRIDGE, Mass. – More than half the consumers questioned in a recent survey are opposed to the AT&T-conceived Consumer Communications Reform Act.

The public response was part of a random survey conducted by The Yankee Group, a consulting firm here. About 550 consumers were contacted by phone and mail in 30 urban and suburban areas served by Bell System operating companies in various parts of the country.

Fifteen states were represented in the survey, which was completed within the last month, according to a Yankee Group spokesman.

About 55% of the consumers said they were opposed to the legislation which is now pending in various versions before both houses of Congress. Of those questioned, 34% said they supported the act and 11% were undecided.

Three Questions Posed

Three questions were asked, with the first explaining the proposal and asking whether the consumer was in favor. If the respondent said no, he was asked whether his answer would change if passage of the act resulted in a "minor or modest" decrease in monthly phone bills.

About 62% of the negative respondents said a decrease in their phone bill would not alter their opposition; 23% would be in favor; and 15% would be undecided under those circumstances.

A third question was whether the consumer had previously heard of the legislation, and only 12% said they were familiar with the bill.

The Consumer Communications Reform Act was first proposed before the House of Representatives in March [CW, March

(Continued on Page 4)

Misuse of SSNs by Government Possible Under Tax Reform Bill

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Protection from government misuse of Social Security numbers (SSN), provided by the Privacy Act of 1974, could be eliminated by a provision of the Tax Reform Act of 1976.

Added by the Senate Finance Committee and debated here on the floor of the Senate last week, Section 205(C)(i) of this omnibus tax reform act would permit any state or political subdivision "in the administration of any law or program within its jurisdiction [to] utilize the Social Security account number . . . for the purpose of establishing the identification of individuals affected by such law or program."

Agencies could also "require any individual who is or appears to be so affected to furnish . . . [his] Social Security account number."

This would not only authorize state and local government agencies to begin using the SSN as a universal identifier, but also would encourage unrestricted use of the number, some critics believe.

Only two years ago, Congress, fearing the SSN was becoming a de facto universal identifier, made it unlawful for a federal or state agency to deny to any individual any right, benefit or privilege provided by law because of that individual's refusal to disclose his SNN.

'Grandfather Clause'

To avoid wholesale conversion of government information systems, drafters of the Privacy Act of 1974 saw fit to include a "grandfather clause" exempting systems in existence and operating before Jan. 1, 1975, if such disclosure had been authorized by statute or regulation adopted prior to that date.

As a result, agencies already requiring the SSN could continue to do so, but agencies could not require it for new systems of records.

The provision, is being pushed by Sen. Russell B. Long (D-La.) who "insists" it is impossible to enforce his parent locator law and "catch welfare cheaters" without it, a Congressional staff member said. However, the Parent Locator Service was

(Continued on Page 4)

Computerworld Enlarges Family

LONDON – Two publications have been added to the worldwide Computerworld, Inc. family of publications – *Computer Management* and *Export Direction.*

The two monthlies were acquired from Special Interest Publications Ltd. (SIP) and will be run by a new company within Computerworld Publishing Ltd., an existing UK subsidiary.

The managing director for the new company will be Tony Vickers, currently a director of SIP. Donald R. Ingleton, previously managing director of SIP, will join the firm as a director.

The majority of the two publications' employees will remain under the arrangement.

The monthlies join *Computerworld* in the U.S., *Shukan Computer* in Japan, *Computerwoche* in Germany and *DataNews* in Brazil as members of the Computerworld, Inc. publications group, providing the firm with an international information gathering and dissemination capability.

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With No Witnesses on Stand

IBM Judge Makes Himself Scarce...

By Edith Holmes

Of the CW Staff

NEW YORK – There's never been a jury in the U.S. government's antitrust case against IBM. These days there's hardly a judge.

For the better part of the last two weeks of trial, Judge David N. Edelstein has stayed in his chambers, catching up on work in this and other cases, while the parties read deposition and document testimony into the record in Courtroom 110 of the Federal Courthouse here in Foley Square.

The judge made his decision to conduct the trial by reading the daily transcripts rather than by presiding over each day's proceedings when he learned the Justice Department probably won't call another witness to the stand until the end of September or the beginning of October.

Upon hearing the "fighting machines" or "product announcements" portion of the government case dealing with IBM's conduct in the marketplace would rely primarily on some six depositions and as many as 1,000 documents, Edelstein asked, "Does that suggest that there will not be any live witnesses of any consequence for the next few months?

"You mean I am just going to sit here and listen to depositions?"

When he received confirmation of his fears, he asked, "Why? Is this for the convenience of witnesses or the convenience of counsel?"

The lead Justice Department attorney for the case, Raymond M. Carlson, assured Edelstein the government's plans aren't designed to suit anyone's convenience.

"That's the way it falls, Your Honor," he said in a recent robing room conference.

When the judge did return at the end of the first day of this procedure, in authoritarian fashion and with a benevolent tone, he asked the parties if they had any problems to report.

"No, Your Honor. We have made quite a bit of progress as a matter of fact," Justice Attorney Charles E. Hamilton III, who has overall responsibility for this part of the government's case, responded.

"I am delighted," the court replied.

The truth was the parties *had* made quite a bit of progress in the judge's absence. For the first time in many months of trial, the government was able to stick to its time schedule, finishing everything it said it would for that week – and more. Daily transcripts swelled 40 to 50 pages beyond their typical length.

IBM counsel's objections were either short and to the point or nonexistent. Hamilton read so quickly through the designated portions of the depositions that the court reporters told him he was giving their fingers a workout.

Analysis

After 14 months of trial, the sudden absence of the judge startled some.

One IBM attorney, who entered the courtroom shortly after Edelstein left it, didn't notice the empty green swivel chair behind the bench until he had walked to the end of the long aisle leading into the courtroom. The stunned expression on his face brought laughter from those who had already recovered from their surprise.

Once the humor of the situation faded away, however, the judge's absence raised questions in the minds of those who have to stay and listen to deposition and document testimony.

All of a sudden, the questions came: Why read all these exhibits out loud, only to have them transcribed and retyped into the record by the court reporters? Why not follow some other procedure? Those depositions and documents which bring no objections from one side or the other could simply be incorporated right into the transcript.

The government cites a section of the Publicity in Taking of Evidence Act of the U.S. Code as part of the reason why deposition testimony is read aloud. But both parties agreed they are following this procedure and have been since the trial began in May 1975 because Edelstein ordered it at a now-distant pretrial conference.

It could be that the judge intends to let the parties stew in their own juice – and to refuse to stand by the stove to watch over the broth – in an effort to force the agreement and cooperation he has repeatedly sought from them.

It could be that Edelstein's sense of the history he and this case are making necessitates eliminating all procedures that can later be called excessively innovative for a trial of this magnitude and gravity.

It could be that this procedure is being followed for any number of reasons – but it does come across as a ridiculous waste of trial time.

. . . IBM Counsel Follows Suit

NEW YORK – The judge hearing the U.S. vs. IBM antitrust trial wasn't the only one who wanted to be absent from the courtroom here recently.

IBM's lead counsel, Thomas D. Barr, requested he be permitted not to be present in court every day until Nov. 1 in order to work on this case and the private antitrust suits being brought against the corporation on the West Coast.

And in the same robing room conference with Judge David N. Edelstein, the U.S. government's head lawyer, Raymond M. Carlson, once again raised the specter of his eligibility for retirement next year.

Barr suggested Nicholas deB. Katzenbach, vice-president and general counsel for IBM, take his place in court as the person with absolute authority to speak for the corporation until the attorney from Cravath, Swaine & Moore returns to the courtroom on a full-time basis.

Carlson worried that without Barr to speak for IBM, there would be no one with the authority to make decisions for the defense in the courtroom. He was assured Katzenbach would have such authority.

The government attorney then said he thought the Justice Department might end up with other problems as a result of Barr's request. "But I would like to have an opportunity to discuss it with my superiors because I am, as you know, near retirement age and the same problem may be presented to Your Honor because of me, and I don't know what the implications of that may be," he said.

The judge recalled Carlson has had to discuss court matters with his superiors on sufficient occasions to question his ultimate authority to make decisions on the spot.

"Somebody has to be in this court with authority to make decisions and if you have no authority to make decisions, get somebody who does," Edelstein said.

In addition, he told Carlson, "If you think you can just walk out on this court without my consent because you consider retirement, you have another thought coming."

Ultimately, the judge granted Barr leave on a day-to-day basis and told the IBM attorney he would look to his partners rather than to Katzenbach for decisions which speak for the defense.

And, ultimately, Carlson is the only one of the "principals" in the case who continues to appear in court.

On the Inside This Week

NEWS

Bank Found Guilty for Causing Frenchman's Bankruptcy . . 4
Biddle Blames NBS, Ansi for Lack of DP Standards 5
FBI Request to End CCH: Plea for Message Switching 6

EDITORIAL

Editorial: The Human Element 8
White Hat, Black Hat: The Two-Edged Sword 9
Taylor Report: Form Helps Document Decision-Making . . 9
Nondisclosure Agreement Crucial for Software Sellers 10

SOFTWARE & SERVICES

Customized System Solves Problems for Novice User 13
Univac Extends 'Cade' Software 14
Method Assumes Goals More Important Than Structure . . 16

COMMUNICATIONS

Adoption of X-25 Could Signal New Era of Problems 17
DP Departments Should Be Used to Trim Phone Bills 18

TERMINAL TRANSACTIONS

Termiflex Portable Unit Designed for Mini, Micro Users . . 19
Joysticks Link CRTs with DG, DEC Minis 19

SYSTEMS & PERIPHERALS

CDC Disks Increase 370 Users' Storage 20
Sale of CPU Involves Series of Steps 21

MINIWORLD

Turnkey Keeps Dealer Out of the Woods 24
Turnkey System May Prove Best Choice for Novices 25
Small System Gives Firm Flexibility to Try and Err 26

COMPUTER INDUSTRY

GSA Competitive Bidding Found Waning 27
Lessor Sues IBM, Charges Leasing Monopolization 27
ITC Will Make Own Tape, Has No Plans to Enter Market . . 28

FINANCIAL

CDC Net Climbs in Quarter, Six Months 42
Burroughs Income Up 8.5% 42

Decisions

"Okay, Whitlow, you've marketed 1,000 SyncSorts. Now would you like to try for 2,000?"

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If the question is sorting, the answer is SyncSort.

Sometimes we almost feel like Archimedes. It's as though we've discovered a natural law of our own.

Even the Ph.D.'s around our place regard our discovery with a certain amount of awe. They refer to it, in hushed tones, as the "SyncSort Factor."

It's a progression that goes something like this:

1. IBM will continue to make and market computers. (That seems like a safe $2 bet.)
2. The busy people who use these computers will naturally require the best sort package they can obtain. (Sorting is the most frequent job on any commercial computer.)
3. These people — being intelligent men and women — will sooner or later find their way to SyncSort III-and-a-half. (It's the best sort package on the market.)
4. None of the foregoing will harm our business. (We will continue to update our package so that it will always stay ahead of the competition.)
5. This will lead to more sales and more improvements. (Maybe we should call our discovery the "Law of Perpetual Sorting Improvement!")

If you'd like a graphic representation of the "SyncSort Factor" take a look at the picture below. These graphs depict what happens when you match SyncSort III-and-a half against other sorts on the market today:

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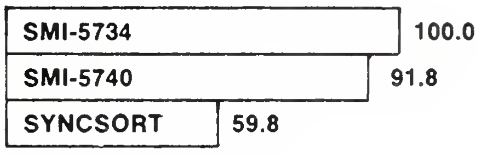

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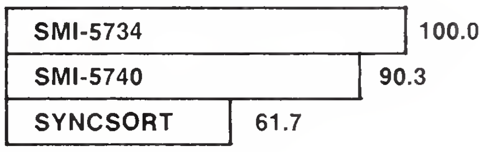
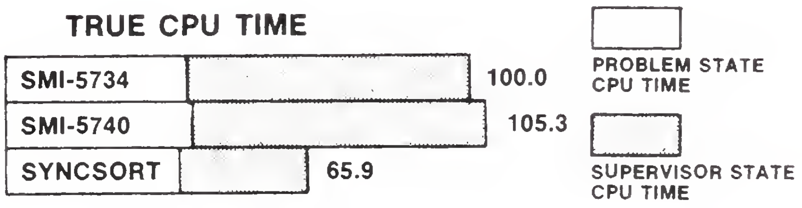


TRUE CPU TIME



Performance is, of course, the bottom line in sorting. But it's not the only thing you should consider in choosing a sort package. Is the sort versatile, for example? Will it support 3350 devices in their native mode without having to sysgen a new system? SyncSort III-and-a-half *will*.

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We will. In fact, we *like* receiving questions from users. It's a hangover from the days when we were pioneering all those developments that opened up the sorting industry. Once an explorer, always an explorer!

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Bank Found Guilty for Causing Frenchman's Bankruptcy

By Andrew Lloyd

Special to Computerworld

GRENOBLE, France – An appeals court here has awarded a fruit and vegetable wholesaler $275,000 in damages because of an error in a bank's computer system which resulted in his bankruptcy.

Eugene Rochette had been granted an overdraft facility of $24,360. But toward the end of 1973, Credit Lyonnais, France's second largest bank, bounced several of Rochette's checks even though he was still covered by the overdraft.

In addition, it appears Rochette's account was not credited with checks he had deposited.

The news of bounced checks spread fast and Rochette lost both his suppliers and best customers. A few weeks later he was declared bankrupt.

The error by the bank, a large IBM user, is still being isolated, but a spokesman said it seems to have originated from a combination of circumstances.

First there was a software or operational error, "a program bug or an operator entering the wrong code," a bank spokesman said.

But there also seems to have been a communications failure. Rochette's verbally granted overdraft facility was apparently not registered on the bank's regional computing center in Roussillon, which handled his account.

In addition, the whole issue was complicated by a postal strike which held up a bank request to Rochette to put his account back in the black.

As a result, the account was not credited for a period with payments made by Rochette into his account, and the bank began to bounce his checks.

The case was first tried last September, when the bank was ordered to pay $140,000 damages.

The bank appealed, but last week the appeals court not only upheld the conviction, confirming the bank's liability, but almost doubled the damages and ordered the bank to pay 8% interest charges as well.

Credit Lyonnais is still taking stock of the implications of the recent verdict. And, while it was "extremely surprised" by the court's decision, the bank is not considering further appeal, it said.

Tax Bill Could Bring Government Misuse of SSNs

(Continued from Page 1)

given all the authority it needs to obtain the SSNs of deserting parents by federal regulation, she said.

Another Amendment

At press time Sen. Charles Percy (R-Ill.) had introduced an amendment that would permit state taxing authorities to use the SSN, but would expand use of the number no further.

The Long provision "goes too far when it would repeal all the protections against widespread use of the SSN which was the focus of Section 7A of the Privacy Act," Percy said on the Senate floor.

"The provisions of the Privacy Law dealing with expanded use of the SSN were under considerable study by several House and Senate committees and by the Department of Health, Education and Welfare.

"Certainly we hear concerns about anti-Washington sentiment and Big Brother. Let us alleviate this concern by not having people feel that in a great big government in a great big country like this all they are is a number identifiable and accessible every which way," Percy said.

Staff members from senators Percy, Goldwater (R-Ariz.) and Ribicoff (D-Conn.) met with Long last week to see if a compromise could be reached, but were unsuccessful.

Long is expected to introduce an amendment to the Percy amendment, which has to be voted on first, but a spokeswoman from Percy's office said she thought "we have enough votes to win."

The tax reform bill was passed last December by the House without the controversial provision.

Rep. Edward I. Koch (D-N.Y.), a sponsor of the Privacy Act, who is also a member of the Privacy Protection Study Commission, is opposed to the Long provision.

"I do not believe the number should be extended except on a case by case – a need-to-use – basis. State taxing authorities have demonstrated a need for it, for example, but I'm against simply allowing it without an agency coming in and demonstrating a need for the number."

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Some Papers Not Privileged: IBM

(Continued from Page 1)

they were in other ways connected to the legal effort of the firm and therefore privileged under the idea of attorney-client communications.

Furthermore the firm has claimed it would suffer from the release of the documents because once they were made public they could be used by private companies suing the firm in their cases – even if they are later held to be privileged when and if there is an appeal of the government's case.

Usually a defendant or plaintiff in a case cannot appeal portions of the case while it is still being tried, unless the judge neglects his duties.

Both sides wait until the case is completed and then take the case to higher courts for a decision based upon the entire record in the case.

Both times IBM has taken the issue of privileged documents to a higher court, the higher courts have ruled that IBM will have to wait for its appeal until the case is complete in district court, since they found Edelstein's orders on the documents to be within his discretion.

But this early wrangling over the documents almost certainly signals IBM will make the matter of privileged documents part of its appeal if it receives an adverse ruling from Edelstein in the case.

Consumers Opposed to Bell Bill

(Continued from Page 1)

22]. Since then it has gained support from 129 congressmen and 12 senators, according to The Yankee Group.

The proposed legislation would effectively eliminate competition authorized by the Federal Communications Commission both in the area of noncarrier equipment connected to the phone network and also for the specialized carriers which compete for customers with the existing carriers.

Commenting on the opposition to the legislation reflected in the survey, a Yankee Group spokesman said: "The American public believes in competition; it has been reared to accept that the very idea of a monopoly is suspect. It wants the right to have and own its own [equipment].

"The consumer finds it hard to be in favor of self-serving legislation," especially in this post-Watergate atmosphere. In spite of the name, 'the Consumer Communications Act,' the American voter will want to make very sure such legislation is really in his, and not Bell's, best interest," the spokesman said.

Hearings on the proposed legislation have been tentatively scheduled for late September by the House Subcommittee on Communications by its chairman, Rept. Lionel Van Deerlin (D-Calif.).

Results of the Consumer Act survey were published in a telecommunications study available from The Yankee Group, Box 43, Cambridge, Mass. 02138.

IBM Reduces Data Supplied To Insurance Companies

ARMONK, N.Y. – Insurance companies can get along with a lot less information on their policyholders than they demand, a three-year privacy program at IBM has found.

IBM's employees are no longer asked to provide their Social Security numbers on insurance claims forms. Instead, they use their employee identification numbers, according to Gloria Poetto, staff information representative.

As a second privacy safeguard, internal claims reviews have been eliminated. Instead, employees transmit claims directly to the insurance carriers, she said.

Third, before IBM releases any medical information about one of its employees to an insurance carrier, the employee is informed and must sign a consent agreement.

erisa

The Employee Retirement Income Security Act of 1974 effective January 1, 1976 mandates the recording of all hours worked and not worked, compensated and non-compensated, as well as all dollars affecting employee pension benefits.

Many payroll/personnel systems, including some recently installed, do not allow full compliance with ERISA.

If yours is included, you can find a quick remedy with a call to Joe Nestor at Wang Laboratories, Inc., Tewksbury, Massachusetts 01876, (617)851-4111 or in California call Carl Tarascio at (714)631-0138.

WANG

After 10 Years of Meetings

Biddle Blames NBS, Ansi for Lack of DP Standards

By Nancy French
Of the CW Staff

WASHINGTON, D.C. – Ten years have passed since the Brooks Bill (PL 89-306) was enacted into law, "yet there are still no meaningful hardware and relatively few software standards for DP equipment," A.G.W. Biddle, president of the Computer Industry Association, said here recently.

In testimony before the House Government Operations Committee's Subcommittee on Legislation and National Security, chaired by Jack Brooks (D-Texas), Biddle blamed two organizations: the National Bureau of Standards' Institute for Computer Sciences and Technology (NBS), and the American National Standards Institute (Ansi).

After 10 years of meetings, Ansi's X3T9 I/O channel level interface committee only now has seemed to agree on a standard for interconnecting peripheral devices to a central CPU, he said.

Even if adopted, little standardized equipment is likely to result since compliance by manufacturers and users will be purely voluntary. Further, "equipment interchangeability is deemed by many in our industry to be counter to their corporate self-interest," he charged.

Millions of Dollars Wasted

In the meantime, untold millions of tax dollars have been wasted because of the inability to freely shift peripheral devices within the federal DP inventory, he said.

"Any process which consumes 10 years of effort without reaching agreement on an official standard the industry has long acknowledged as 'de facto' is woefully in need of reform," Biddle said.

Ansi does not write standards, but rather it provides "a vehicle for industry-wide participation in the standard setting process." Thus, if there are recalcitrant members on the standards committee – such as IBM and the other large mainframe manufacturers on the I/O channel level interface committee – the entire standards effort can be thwarted," he said.

"The Brooks Bill assigned NBS a leadership role in development of DP standards in the federal sector, and that it has failed to do," Biddle said.

Had NBS acted, "we would have a standard in the federal inventory and, in all likelihood, adoption of that standard by the states would have followed.

"In time, private-sector DP users would realize they, too, could save money by insisting the next generation of equipment have certain standards," Biddle said in conversation after testifying.

"NBS won't push for I/O standards unless the federal agencies press for them. The agencies are not interested in standards as long as the General Services Administration (GSA) approves their DP requests without standard interfaces, and GSA will not require standards unless NBS so directs," he said.

The Brooks Act is clear economy and efficiency in government DP procurement are its prime objectives, and adopting standard hardware and software interfaces .would go further toward meeting the intent of this legislation than all the GSA oversight in Washington, Biddle said.

Standard interfaces would promote a competitive multivendor environment with quantitatively recognizable cost savings to the Federal government, he said.

"The only way you're going to free the DP user is to eliminate the horrendous cost of conversion, and the only way you're going to eliminate the horrendous cost of conversion is standardization of languages, software, I/O channel interfaces, communications standards and protocols," he added.

"GSA knows this. OMB knows this. NBS knows this, but no one seems to be willing to act," he said.

Biddle cited the difficulties encountered with the communications system now contracted to Computer Sciences Corp.'s Infonet Division as a standards problem.

Because of "a lack of standard programs and languages used to operate this system," federal users have found they are "locked into Infonet" and "unable to modify or upgrade this system to meet their communications needs."

The government has requested bids for a communications system that will meet its need for flexibility, but to no avail. The request for bids has been extended for 15 months, yet no one has been willing to bid because the Infonet system is essentially locked in, he said.

"When the government has been able to validate standards, it is often to the credit of an agency other than the National Bureau of Standards.

"The Cobol validation, for example, was first done by the U.S. Navy – not NBS – which only later adopted the Cobol standard through the American National Standards Institute," he said.

A similar process is now taking place with the Fortran validation, he said. "Again, it is the Navy that has been pressing for Fortran validation, with NBS lagging behind."

If GSA "is really earnest about distributive data processing for the Federal government, it strikes one as curious [it] has shown so little concern for stimulating the standards effort," he said.

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3) These books are organized by function. A complete subset of BAL is presented in the first three chapters of the book, and later chapters cover such functions as debugging, table handling, subprogram linkage, and file handling. When material is organized in this way, you learn more quickly because you always see purpose.

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Content

The intent of these books is to develop a basic programming skill in assembler language. As a result, the initial emphasis of each book is on a professional subset of BAL along with the related debugging skills. If you did nothing more than master this material (chapters 1–5), I think you would justify the cost of the book several times over.

Beyond this, table handling, subroutine and subprogram linkage, and sequential and ISAM file handling are given primary emphasis. Since these are common programming functions, this material is valuable background regardless of the language you normally use.

Finally, these books show you how to write macro definitions (great background for working with software packages), how to code bit manipulation and translation routines, how to isolate the fields in free-form input data (a common function in teleprocessing programs), and how to work with direct files. This type of material starts you on your way to the more sophisticated tasks required in a computer installation.

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Memo Shoots Down All Alternatives

FBI Request to End CCH: Plea for Message Switching?

By Nancy French

Of the CW Staff

WASHINGTON, D.C. Some federal officials here and sources on Capitol Hill are wondering if the Federal Bureau of Investigation's (FBI) request to terminate the Computerized Criminal History (CCH) program is actually an indirect plea for message-switching authority.

The FBI's request to terminate the CCH program was made public some weeks ago by the U.S. Attorney General Edward H. Levi in a speech in Houston [CW, June 21], but the 13-page memorandum from FBI Director Clarence Kelley was kept under wraps at that time.

A copy of that document obtained by *Computerworld* has revealed that, although written ostensibly to justify termination of the controversial data bank of computerized criminal records, the memo was loaded to support the opposite conclusion.

Only three possible alternatives to an FBI-run message-switching system were proposed, and each was shot down in a way that makes proceeding with the FBI's proposed switching plan seem the only logical way to go.

Frank Buhl, chief of the FBI's National Crime Information Center (NCIC), which runs the CCH program, denied this conclusion, saying "Director Kelley honestly believes that CCH is a classic example of something that came before its time and should be terminated."

But a number of people close to the controversy disagree with Buhl's claim, drawing evidence from between the lines of the memorandum as well as tactics the FBI has used in the past to obtain the power it has sought.

Basically, critics of the FBI's plan to implement a message-switching system contend that "he who controls message switching controls the criminal information system."

The FBI disagrees with this, maintaining that as long as the criminal records themselves are held by the states and can be accessed only through a federally maintained index and communications system, the system is decentralized.

Such a decentralized system would thus comply with constitutional prohibitions against a national police force.

Possible Alternatives

While Kelley proposed falling back on the FBI's fingerprint identification division to service the states, he pointed out that this division, which dates back to 1924, takes 10 days to three weeks to process and return by mail a criminal history from a state identification bureau of the FBI itself.

And FBI officials have admitted that automated fingerprint identification equipment now in the prototype stage will not be fully operational until the early 1980s, so this is hardly a suggestion that inspires confidence among those whose work it is to fight crime.

However, the only other alternatives to going forward with message switching mentioned in the memo and then discarded were as follows:

- Maintaining the status quo with current operations, plans and policies and continuing to promote state admissions to the NCIC/CCH system pending resolution of the message-switching issue by the Attorney General or the Congress.

Kelley called this alternative "impractical" because the FBI would "surely be brought under more and more criticism and pressure to end" current centralized record collection in Washington.

Analysis

- Obtaining limited message-switching authority from the Attorney General and moving ahead with current NCIC/CCH plans to "centralize CCH records to the states."

- Returning CCH records to the states and seeking "new directions."

The memo said this alternative "at first blush" appears reasonable and it has, in fact, been given the most serious consideration.

However, "years of experience clearly indicate that without massive federal funding and mandatory legislation, few new directions can be transposed from the conceptual to reality," Kelley said.

- Terminating CCH and falling back on the basic resources offered by the FBI identification division.

Among the possibilities ignored in the memo were:

- Turning the message-switching responsibility over to the National Law Enforcement Telecommunications System, a message-switching system currently operated by the state.

- Implementing Nalecom, the highly sophisticated state-managed National Law Enforcement Communications system proposed by the Jet Propulsion Laboratory in a research report funded by the Law Enforcement Assistance Administration (LEAA).

- Hiring a commercial service to operate message switching.

Background of the Memo

As background, the memorandum noted the CCH program was initiated by LEAA in 1969 "pursuant to a grant entitled Project Search."

What the memo did not say, however, is that the original Search proposal never suggested that the FBI operate the switching system and recommended instead that it be run by the state of Michigan, according to William McMahon, a criminal justice consultant who was until recently a telecommunications program director in the Office of Telecommunications Policy.

Kelley also reminded the Attorney General that in 1970 the Office of Management and Budget reviewed the question of who should manage and operate CCH, including a message-switching capability, and recommended the FBI operate it.

That is true; however, at that time, the FBI was competing for CCH against the LEAA, basically a grant-administering organization, and Search, a loose consortium of states that showed no clear indication they could get together and pull it off. The FBI emerged as the winner.

Kelley said further that current NCIC/CCH plans call for a central name index and records of all multistate offenders in Washington, with single-state offender records maintained in the states.

To execute this plan, the FBI requires a message-switching capability, Kelley explained to the Attorney General.

Buttressing its argument for FBI control of a message-switching system still further, the FBI memorandum pointed out that, in the absence of a message-switching capability and its resulting decentralized state CCH operations, the bureau must continue to house all CCH records in Washington – raising the specter of "Big Brother."

Without message switching, Kelley continued, the bureau's position is "untenable." Thus "the only viable alternative is to terminate the NCIC/CCH program."

Among the CCH system's deficiencies cited by Kelley in his request to terminate were that the cost and effort needed to establish and operate the system were grossly underestimated; intergovernmental relations problems were legion; and security issues were not resolved.

Soviet Grand Chess Master Defects at IBM Tournament

AMSTERDAM, The Netherlands – Soviet Grand Chess Master Viktor Korchnoi asked for political asylum here last week while attending an IBM-sponsored chess tournament.

Korchnoi, rated the world's number two chess player, had tied for first place at the tournament.

He was expected to fly back to the Soviet Union July 27, but instead went to the aliens section of Amsterdam police headquarters and asked for asylum.

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Editorials

The Human Element

The recent stories relating to computer usage at the Olympics and in the historic Mars voyage [CW, July 26] illustrated both the strengths and weaknesses of data processing.

Certainly the Olympic Games could have been held without computerized scoring. The Games began long before computers were invented. And despite all their time-saving assistance, a computer used to tally gymnastic scores is still only as efficient as its programmer designed it to be.

The Olympic DP problem was really a miscalculation by judges who never anticipated a perfect four-digit score. But it pointed out why computers will never run our lives. They are only as efficient as we choose to make them. And human thought is still the final control even over "human-like" processors.

On the other hand, the trip to Mars could never have taken place without DP assistance. Certainly it is much more desirable to explore a distant planet with computer-controlled instruments than risk human lives in unknown environments.

The DP navigation and control used to complete the Mars mission is a marvel of the level of sophistication that can be programmed into computer systems when the need arises.

The Olympic and Mars computers had one thing in common. Both were used in their own way to make life easier for the people around them. In one case a minor problem cropped up, but in both instances humans remained in control of the situation. That is exactly as it should be.

An Opportunity in Disguise

The lack of representative items from the computer industry at the DP exhibit in the Smithsonian Institution in Washington, D.C. [CW, July 26] may be an opportunity in disguise.

Certainly those who work within the DP environment have ideas on the significant milestones and developments that helped to shape the industry.

In keeping with other exhibits at the Smithsonian, the articles suggested should be noncommercial wherever possible and should not be oriented toward a single supplier.

But within this objective framework *Computerworld* readers should have some innovative ideas on the articles to be included in an industry exhibit.

Suggestions on DP artifacts should be sent to the CW Editorial Department. Innovative ideas, no matter how unusual, are welcome. The suggestions will be forwarded to the Smithsonian staff, and any assistance on where to locate the items will be welcome.

A stronger DP exhibit accurately portraying the role of computers in society will go a long way toward improved public understanding and acceptance of this relatively new technology.

'. . . And Pending Installation of a Decent State Welfare Edit System, I Bequeath My Regular Medicaid Payment to My Dearly Beloved Whispering Valley Nursing Home.'

Letters to the Editor

Data Transmission Industry Just an 'Unfortunate Casualty'

As a DP professional and only a casual reader of *Computerworld*, I have been surprised at the thrust of editorials and letters concerning AT&T and its lobbying efforts in opposition to recent Federal Communications Commission (FCC) rulings.

The CW editorial staff and CW readers seem to feel AT&T mounted this effort solely to drive the fledgling data transmission companies out of business.

The real impact of freedom to interconnect with the AT&T network comes from the potential for inexpensively produced (by other vendors) telephone sets to be purchased by the general public and business community and freely connected without any AT&T-owned equipment.

This would cause AT&T to both capitalize equipment and charge for the communications service separately from the telephones themselves.

Since AT&T-made telephones are currently owned and capitalized by AT&T and only leased to customers and since AT&T's guaranteed profits are linked directly to invested capital, it is small wonder the potential for replacement of these telephones and inexpensively made alternatives has prompted a massive lobbying effort.

The data communications industry is only a catalyst (and possibly an unfortunate casualty) in this battle.

Bob J. Prince

Arlington, Texas

Data Past

Five Years Ago
August 4, 1971

WHITE PLAINS, N.Y. – IBM increased rental prices of its 360 CPUs by about 4% and increased the rental and purchase prices of 370 CPUs and the 2880 block multiplexer channel by about 8%. The price increases partially offset IBM's reduction of peripheral prices last June.

– – –

CAMBRIDGE, Mass. – Harvard University and Massachusetts Institute of Technology (MIT) killed a joint $5 million inquiry into the impact of technology on society.

Eight Years Ago
July 31, 1968

WASHINGTON, D.C. – Joan Van Horn, president of VIP Systems, a computer time-sharing firm located here, charged her one-computer operation was facing extinction because of "unfair competition" by IBM. IBM opened a similar text-editing service using a proprietary software package which it refused to make available to her, she said. IBM offered rates that appeared to be below cost and charged her firm 2-1/2 times as much for her systems as it charged itself for the internal service.

– – –

LOS ANGELES – Computer Sciences Corp. ordered $50 million worth of Univac 1108 computers, one for each of 20 planned regional time-sharing centers in the U.S. and Canada.

FBI Hassling IBM?

The text accompanying the May 24 article entitled "Justice Refutes Charge by IBM That Use of FBI Unconstitutional" failed to support the inference of proof that the word "refutes" invoked.

Far from demonstrating that Justice's use of FBI agents in a civil antitrust case was proper, the article left one with the Watergate-like impression that such an abuse was somehow appropriate because its prevalence was an "open secret."

Does it not seem strange that the FBI, which must comply with a fair amount of red tape before it can be brought into the usual criminal case, which even in a kidnapping investigation must wait 24 hours, can nevertheless be drafted into the front lines of a civil conflict at the whim of the attorney who on any particular day happens to be quarterbacking the strategy of the Department of Justice team of trial lawyers?

Aside from the chilling effect on employee morale that the use of battalions of cops-in-lawyers'-clothing may have, and aside from any question of whether it's seemly for putative members of the bar to carry a gun at an interview, the use of FBI agents in civil matters raises the whole issue of whether this can be a proper allocation of government resources.

Can an FBI agent tell the difference between a floppy disk and a tape drive? Could he recognize a DOS program from a sort package? On the contrary, do not the burgeoning number of bank robberies and the snowstorm of interstate heroin traffic cry out for the attention of these skilled public servants?

Has it come to pass that it is now easier for the Department of Justice to hassle IBM than to chase the Mafia?

Howard R. Popper

Berkeley Heights, N.J.

Computerworld welcomes comments from its readers. Letters should be addressed to: Editor, Computerworld, 797 Washington St., Newton, Mass. 02160.

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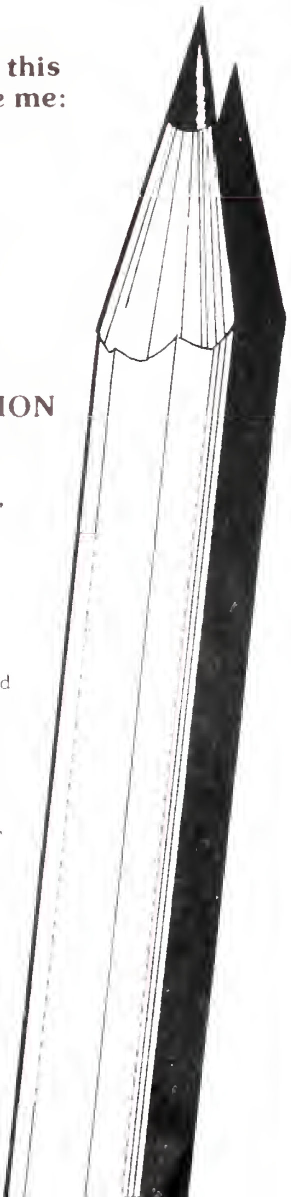

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The Two-Edged Sword

Pricing has always been one of the factors in marketing that IBM handles best. With the exception of a considerable understatement of the first-shift price of the original (1952) Type 701 – an understatement that was almost certainly due to a Korean War patriotic stance on the part of the Old Man, who had been told there was a need for a very few Defense Calculators to help the military and their biggest contractors – the Gray Giant has been unbelievably skilled at manipulating the rate card. As new competitors announced, waxed, waned and disappeared, and as technology changed the cost of developing and manufacturing the pieces of our weird and wonderful tool, the green-eyeshade boys in Endicott and Poughkeepsie and White Plains and Armonk fiddled and adjusted: lower prices, more throughput, free software, charged systems service, purchase and lease plans, new ways of billing maintenance. The ever-changing tapestry of performance versus price was fascinating.

Especially so to me, of course, as the proud papa of Grosch's Law. Enemies, friends, complete strangers are always telling me – somberly, gleefully, querulously – that somebody or something has finally finished it off. I'm supposed to repel boarders, as it were, and indeed I do on occasion. When there are youngsters around, who deserve and need serious commitment, I often point out that the *total* cost of doing a data processing or scientific computing job is not much affected by using the greatest new microprocessor; that the (hidden) inefficiency of an expensive, enthusiastic, inexperienced engineer writing and debugging his own program, as against a professional banging out a few hundred lines of FORTRAN for his musty but trusty 1108, knocks out the savings (conspicuously displayed) of buying the latest thrill-chip.

But for old-timers, for security analysts, for philosophers of our trade, and especially for those of us with a surviving sense of humor, I go a different route. Grosch's Law is not a great, ponderous discovery, like the law of gravity or the conservation of energy; rather, it relates prices and power and people. What it says is that early in the computer game, the professionals – the users, the programmers, the installation managers – let some of the flood of new technology pour down the penstocks and run the turbines: cheaper orbit computing for NASA, check handling for the Bank of America, paychecks for Appliance Park. And some of the flood they let run over the spillways and off down the canyon: virtual storage, interactive nuttiness, giant operating systems, PL-1, even floating point.

And the marketing experts, at IBM first of course, saw this happening, and realized that throughput was not simply what I had conjectured, a square function of price. What it was was a *controllable* function of price! Within reason, the raw power of the stream of technology could be harnassed, and sold to all but the very most sophisticated customers at a price set by the needs of the producer. Particularly, IBM saw it could introduce great new componentry, fantastic speeds, enormous memories, and yet not actually permit the customers to get such improved performance as to encourage them to ship back equipment. Down inside, a torrent of bits was frothing and churning: at the turbine shaft, a few more horsepower were grudgingly released.

It has been a dangerous strategy. On the one hand, a really courageous competitor might start selling raw power; in fact, the Fairchilds and the Intels and the National Semis do so. And on the other hand, grim old Restraint Of Trade lowers from the halls of FTC and the Department of Justice. But for twenty years it has worked.

Now we see a new test. Heartened by the diminishing danger from the antitrust trials, wary of the Japanese threat and the surprising vigor of Burroughs and Univac and DEC, IBM has put a notch in my curve: more bang for, not as usual a few more, but in this case for a few *less*, bucks. The 138 and 148 are to be viewed, it seems to me, not as technical advances, in spite of their LSI-ness, but as adventures in pricing.

Dangerous! Technical advances the antitrust boys can not yet challenge. But trick pricing is *verboten*. Yet look at the problem; IBM is near the limits of the 360/370 architecture. It cannot usefully play an Amdahl; the scale of the IBM game is too huge. It needs time to get minimally workable software for the neo-FS generation, let alone the gummed-up, overelaborated, security-layered, super-virtual mushware needed for 1978 or 1979. The courts, the bureaucrats are weak; IBM pricing is creative: the competition is docile.

Sharp is the sword: pugnacious pricing. Double-edged is the blade. It will be a fascinating year!

Herb Grosch

Form Aids Documentation of Decision-Making Process

Computer system documentation has traditionally been regarded as being used to show how a system is working the way it does. This, however, is in many ways only of subsidiary interest.

The Taylor Report

By

Alan Taylor, CDP

How a system actually is working is simply a technically interesting factor. Why it was designed to work that way and whether it was so intended to work that way is often the key question to be answered after the event.

Neither of these questions are answered by the traditional documentation showing the flowchart, files, timings, etc.

Jerry Alders, a Dallas programmer, has come up with a systematic way of adding these decision points to the documentation, without taking up too much room or requiring anyone to wade through mountains of narrative.

For instance, a particular function, such as a table lookup, can be handled by generalized programs or by a tailor-made program. While these two alternatives need noting, the differences between the two techniques are only a part of the necessary considerations.

More detail is required before decisions once made can be reviewed at a later time. Even the degree of tailoring is a variable.

Three Change Levels

In Alders' suggested alternative documentation, illustrated in the figure, space is allocated for three levels of change for any particular alternative. Sometimes, of course, a particular alternative is available only as a major change. Here, only the existence of the feature needs inserting.

While the form is basically designed to handle a single alternative broken down into parts and analyzed, its layout with a number of divisions permits two or three simple alternatives to be illustrated upon a single form.

This is particularly useful when there is some overriding advantage or controlling factor involved in the choice – such as one way being the only way the budget can be maintained or the only way the schedule can be kept.

Under these circumstances, only two alternatives need be illustrated – one the way that would be used if the constraint did not exist and one the way that is in fact forced into existence purely through strength of the budget, schedule or whatever the requirement is.

Impact and Benefits

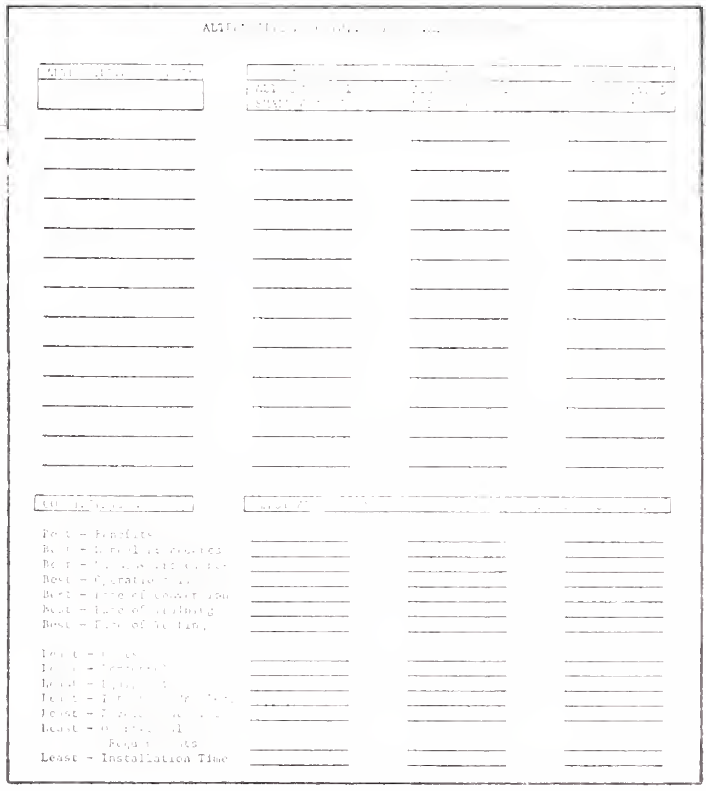
The rest of the form is taken up with a joint impact and benefit analysis. Here a number of standard considerations are taken such as the training question, developmental time, etc. Unlike the first parts of the form, these should be responded to individually. Not-applicable, or no-change entries are allowable, but consideration should be given to each area.

This way there can later be no question as to whether the additional operational cost involved, say, in taking some quick-and-dirty approach was appreciated at the time the decision was made.

'X' Marks the Spot

To make the system as unburdensome as possible, all that need be entered are Xs indicating the most desirable result. A lot of 'X' on the finally approved decision would be nice, but is not normally realistic. An approach that minimizes training, testing and operational requirements is most unlikely to also minimize developmental time and costs. Normally, a trade-off situation is quickly illustrated, and the final decision can be annotated on the form itself if denied.

There is, of course, the question of technical errors. Sometimes an approach is expected to be low cost, but turns out to be high cost. Using the form as a part of the documentation permits this case, where the costs have resulted from some technical oversight or error, to be distinguished from the other case where the costs were in fact foreseen, but the decision to incur them was taken with accurate and appropriate input.



Least - Installation Time

The form shows a method of documenting the various considerations used in evaluating a single decision during systems analysis.

The Alders form permits, and in fact demands, technical reporting in simple, easy-to-understand manner, one capable of unambiguous later review.

Without the use of such a form, it is generally found either that the documentation is missing entirely or that it is contained in memos, formal reports, etc. (These themselves are often contradictory.) This method, which only takes about a minute per form to fill out, provides everyone from the coder to the vice-president with the capability of documenting decisions and the reasons quickly and accurately, yet ready for integration with the rest of the system documentation.

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Reader Commentary

To Protect Developer's Ideas

Nondisclosure Agreement Crucial for Software Sellers

By Charles A. Gravitt

Special to Computerworld

Thinking about selling some of the computer software you developed? Many private companies and some governmental agencies are doing this on a selective basis to recoup some of the high cost of developing it.

The process of making the business decision of whether to sell your software presents a plethora of issues to be considered. But once your company has decided to sell the software, arrived at a price which will produce a reasonable return on investment and resolved all of the pros and cons recognized, there is still time to think about protecting your "bread and butter" software before disclosing it.

Whether you only passively offer software for sale and make few disclosures or engage in an ambitious marketing effort with numerous disclosures, you need to take positive action to preserve your rights in the software.

To not do so may be a grievous error. You could not only lose windfall income, but an invaluable competitive advantage as well.

The existing patent and copyright laws and the interpretation of them do not offer the software developer a great deal of practical protection.

If the choice is made to seek a patent, the software creator risks losing his trade secret protection because he must disclose the code. The patent application process is relatively expensive, and a patent award for computer software has been seldom granted.

Patent applications may, at the present time, be rejected by the U.S. Patent and Trademark Office when it is determined the novelty of the invention is related to the computer aspect of the system. In the Johnston case, the U.S. Supreme Court recently affirmed the denial of a computer software patent application because the solution was obvious.

Registering computer software for copyright likewise involves a disclosure of the ideas and methods employed in the code and probably the code itself.

However, currently the U.S. Copyright Office will probably reject registration of computer software for copyright protection.

Pending copyright legislation may incorporate a more liberal interpretation of the requirements for publication under existing laws. If enacted, this new legislation would include restricted licensing or leasing of software to a limited group of customers.

In addition, new procedures or regulations embraced under this pending legislation would allow public disclosure of only a brief description of the computer software instead of the full and complete text now required. While the deposit of the complete description would still be required, public inspection – and thus public disclosure – would be limited to the brief description provided for that purpose.

'Common Law' Copyright

Until patent or copyright protection for software becomes ironclad under case law or further federal legislation, "common law" copyright and trade secret legislation are the software developer's best allies.

To take advantage of common law copyright without registering any material, listings of program code, procedures and related documentation should all be marked with a warning such as: "This material is the exclusive confidential property of XYZ Co. All rights, including copyrights and patent rights, are reserved by XYZ Co."

This warning will put anyone who reads your documents on notice of your belief in your rights and your intention to enforce them to the extent possible.

Generally, any procedure, method or other device which gives you an advantage over your competitors can be considered a trade secret.

However, in order to retain any rights under existing laws, your company must be careful not to inadvertently or intentionally disclose your trade secrets; such disclosure will likely nullify any protection you might ever have had.

Since computer software must be disclosed, at least in part, in order to make a sale, a carefully prepared nondisclosure agreement between you and the prospective customer should be signed before any specifications beyond the general sales brochure are disclosed.

In my opinion, a comprehensive nondisclosure agreement is an indispensable element in dealing with prospective customers for sale of your software. Without it, there is no private obligation to assist in protecting your property, and you are left to rely on general principles for relief should damage occur, particularly if a sale is not consummated.

The execution of this agreement will place no undue burden on the reviewer and is merely an extension of the good business practice of dealing at arm's length. The reviewer will appreciate your concern for the software and readily see the need for the agreement.

As an aside, such an agreement has certain intrinsic value to show your software is worth protecting – and may even enhance its marketability.

The Agreement Itself

All of the general requirements for completeness and accuracy that apply to any business contract are applicable to a comprehensive nondisclosure agreement. If the contract doesn't say what the parties' responsibilities and liabilities are, those items omitted will be difficult, if not impossible, to enforce.

Several critical and salient points of a typical nondisclosure agreement will be covered here. Many of the points are quite standard and will be mentioned with brevity. But one should not let this briefness obscure the importance of these items – each and every clause is absolutely necessary for your protection.

Let me preface these with a word of caution: Every contractual situation is unique with its own special problems and, at some stage of development, should be dealt with in isolation from the general case.

Competent legal counsel should be sought before finalizing the contract. It cannot be stressed enough that a complete nondisclosure agreement executed now could remove a number of lively issues from debate later and possibly avoid damage and lengthy litigation.

The contract should detail the parties to the contract together with their principal business addresses. If a party is a corporation, the state of incorporation should be included. In order to be valid, the contract should be signed only by a duly authorized officer of the corporation.

Consideration is an essential element in any valid contract. One party does one thing in consideration of the other party doing something else. If there is no consideration, the contract may be null and void.

The company disclosing the computer software should state what specifically is being sent for review; it thus is covered by the nondisclosure contract. The material can be itemized in an exhibit to the contract; verbal disclosures also need to be brought within the realm of material being protected.

The agreement should state a definite period during which the material may be kept and studied; a statement should note that the material is being made available for temporary use and only for review purposes.

Prohibition against the reviewer's disclosure of the material, in whole or in part, to any other person, firm, corporation or governmental entity should be spelled out clearly. Permission to allow secondary disclosure to affilates or wholly owned subsidiaries could, however, be given at the option of the material owner.

The reviewer should agree it will not assign, sell, license, franchise or otherwise convey the covered material to any third parties or to unauthorized personnel.

The reviewing party should be obligated to make its employees and agents aware of the terms of the nondisclosure agreement, agree on behalf of everyone who will have access to the material that it is the owner's trade secret and proprietary in nature (whether any portion is validly patented or copyrighted) and agree to be responsible for and pay compensatory damages in case of unauthorized disclosure.

There are severe penalties for stealing trade secrets under existing laws, so the exposure to wrongful conversion to own use is somewhat reduced.

Once the review period has expired, it should be mandatory for the reviewer to warrant in writing that the material and all copies of it have been returned to the owner or destroyed and that the reviewer has no material remaining in his possession.

Another technical drafting consideration is establishing the situs of the contract, that is, the state under whose laws

(Continued on Page 12)

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Letters to the Editor

Serious Omission

I was quite pleased to read the article, "Guitar Maker Plucks Own System From OEMs' Shelves" [CW, April 5], about our company.

I must, however, point out one serious omission in regard to the system configuration. Perhaps the most important component is the Diablo 44 disk drive and controller, which was purchased from System Industries of Sunnyvale, Calif.

It should also be noted the disk Iris operating system, developed by Educational Data Systems, was purchased from System Industries. This was part of the disk system package and, frankly, one of the best ways to guarantee system operation.

By purchasing software together with the disk, one supplier is really responsible for correct operation of all units, which is quite often the failing of mixed vendor systems.

John C. Hall
DP Manager

Rickenbacker Co.
Santa Ana, Calif.

Sometimes every performance has to be a perfect performance.

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The reasons for using 6250 CPI recording — like increased packing density and faster data transfer rates — are good ones.

But you need to recognize certain complexities inherent in these systems. You should know that because of masking by the GCR format, normal system interrogation doesn't give you a complete error listing. Ask your Graham product technology man for details.

Also, at 6250 CPI, debris sensitivity is increased tremendously. That's why, instead of ordinary computer tape, you need Epoch 4. It's certified error-free, and it resists debris-creating stresses longer than any other tape.

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Nondisclosure Agreements Can Protect Software

(Continued from Page 10)

the contract will be construed. If you want it to be your principal place of business, the contract should say so.

Special Problems

There are special problems associated with international contracts. Also, some business transactions with certain foreign powers could require prior approval by the U.S. government.

You should obtain counsel before entering into any exploratory negotiations or agreements with an international party.

It is a good idea to have the nondisclosure covenants survive any termination of the agreement for three to five years if this can be negotiated. This will allow time to discover any unauthorized disclosures and determine the extent of damages.

It also places a burden on the reviewer to be diligent in following up with his employees who might innocently believe there is no longer any reason to protect your secrets after the material has been returned.

The owner should be entitled to an injunction restraining the reviewer from committing a breach or threatened breach of the nondisclosure agreement, without a proof or showing by the owner of any actual damages. In order for this clause to be effective, it must be in the agreement.

Further clauses can be written into the agreement to provide for a wide variety of considerations or contingencies such as shipping charges, settlement of disputes by arbitration and obligating a party to make any necessary filings with government agencies. These should be incorporated into the agreement as the situation demands or your company deems necessary.

Each Case Different

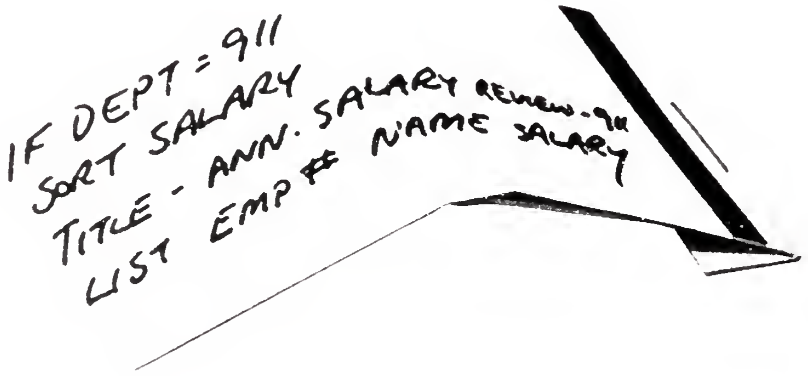
The nondisclosure agreement suggested here and the reasons for it cover the general case.

Your own unique situation may dictate further protection or an alternative method. Examine your case carefully before deciding what to do. If you can't do this for yourself, secure competent advice.

One of the gravest pitfalls that can be encountered is to impulsively assume the general case applies in your situation. As surely as you do this, you will find that the characteristics assumed in the general case happen not to be those which apply to your special case.

I believe the nondisclosure agreement is essential to presale protection for your software when more is to be disclosed than general sales information and has proven to have a calculable return on investment.

Gravitt, an attorney, is general manager of computer planning at a large U.S. airline.



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Customized System Solves Problems for Novice User

GAINESVILLE, Ga. – Keeping up with the cost of goods sold and profit margins "can really be a problem when you're talking about 8,000 different parts stored in three separate locations and coming from 30 or 40 different vendors," according to Ted Ross, president of Ross Equipment, Inc.

That was the kind of problem that made Ross – a dealer in heavy logging equipment – decide to upgrade from the magnetic ledger card system he had used for about two years.

"We just couldn't get enough work out of the old system," he said.

But Ross didn't want to become a computer expert, so he turned to a systems house to find a solution to his problem.

Though Ross and Computer Software, Inc. (CSI) of Atlanta looked at several hardware configurations, each vendor knew in advance CSI would be providing the system design and the application software.

The application software would consist of invoicing, inventory control, accounts receivable, accounts payable, general ledger with financial statements and payroll.

CSI developed a system to provide real-time inquiry into all master and transaction files as well as on-demand reporting of receivables, back orders, open purchase orders, open payables, general ledger activity and, of course, inventory.

All report programs were designed so they can be run in background mode, leaving the terminals free for data entry and inquiry.

The inventory control system in effect maintains each of the product lines as a separate inventory for reporting purposes. The system has the ability to print the reports in the same sequence as the vendor's price list, regardless of the part number used for billing and inquiry.

Inventory reporting is on a weekly and monthly basis. The weekly inventory report shows on-hand and on-order quantities at each location; the weekly reorder report shows items below minimum in each location and whether stock can be transferred to fill in shortages.

Major Problem Solved

The major problem of inventory cost was solved by an open purchase order system which updates inventory costs by order cost and later adjusts cost if the billed cost is different.

Another area of great concern to Ross was the total profit picture on his heavy equipment sales. The CSI system generates a report detailing all presales preparation cost and postsales maintenance costs for a particular piece of heavy equipment.

Before the system was installed, all billing and receiving were held up until the general ledger could be closed out. At times it would take from the 25th of one month until the 20th of the next to close out the previous month.

The CSI system was designed to allow Ross to go ahead with the next month's billing and other work and close out the general ledger when all the figures are in, no matter how long it takes.

Because of the structure of the company, Ross requires in-depth financial reporting. He has 800 general ledger accounts which generate 32 separate financial statements by department within branch and various levels of consolidation. Once all data has been entered, the entire general ledger period-end closing is performed automatically.

For various reasons, CSI and Ross finally chose a Nixdorf 8870, including two CRTs, 10M bytes of disk storage and a 165 char./sec printer. The $45,000 system is located here in Gainesville and information flows to and from the other branches in the form of source documents and weekly reports.

Both the hardware and the software are capable of handling remote terminals when they become economically feasible in the remote branches, Ross noted. The programs are written in Business Basic and are totally interactive, according to CSI.

Installation was completed last March and went "very, very smoothly," according to Ross, even though the mainframe was one of the first Nixdorf 8870s in this country.

"We had our doubts about an uproven machine, but the combination of hardware support from Nixdorf and software support from CSI has made us real believers," Ross said.

"While the software was only a fraction of the hardware cost, we knew that it was the programming that would make or break the system," he concluded.

'Production IV' Features Back Immediate, Long-Range Planning

WOODLAND HILLS, Calif. – Features added to Production IV software from Informatics, Inc. support long-range planning on the one hand and immediate assembly decisions on the other, according to the firm.

Production IV was described as a family of modules designed for manufacturing planning and control that provides the facilities with which a company using an IBM 360/370 can reach the optimum goals of reduced inventory, increased productivity and improved customer service.

The Master Schedule Maintenance (MSM) feature has been added to the software to show management the relationships between marketing requirements, a proposed master schedule and projected finished goods inventories, Informatics said.

The second feature added, Kit Marshalling (KM), checks the availability of all components before the release of assembly orders to the shop, a spokesman added.

KM performs a "paper fill" of selected orders by allocating materials on a combination of due dates determined by the Material Requirements Planning (MRP) module, with options for manual override.

Options are also provided for calculating reduced order quantities based on critical components, the spokesman noted.

MSM is said to be especially useful for high-volume or build-to-stock manufacturers. As new market forecasts are entered, projected on-hand balances are recalculated and displayed using the current production program, according to the spokesman.

Although designed to be used with Production IV, both MSM and KM can be purchased separately.

Written in Cobol to run under DOS or OS, MSM costs $3,500 while KM costs $5,000. Production IV with MRP – "which most installations have" – runs in 128K and costs $50,000 to $110,000, depending on other options selected, the spokesman added from 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

'RACF' Tightens OS/VS Security

WHITE PLAINS, N.Y. – The Resource Access Control Facility (RACF) software announced recently by IBM allows installations under OS/MVS to limit users' access to only those areas in the system required to do their jobs, a spokesman said.

Designed for use in batch mode or with the Time Sharing Option, RACF provides control by identifying and verifying users of the system, authorizing and logging access to information on disk storage devices and logging detected unauthorized attempts to use the system, he added.

To put this program product to work, a center's DP management establishes program profiles and access authorization levels for individual users, groups of users and specific information that requires additional security protection, he said.

Users identify themselves when they attempt to enter the system. Even if RACF verifies their identities, users can access only the data for which they are authorized and that is managed completely by the previously defined RACF profile.

Unauthorized access attempts can be routed to a security console for immediate action. In any case, an audit trail of access information, including the authorized attempts, can be generated for later analysis, IBM said.

The software can be used under OS VS2 Release 3.7. It has no special hardware requirements other than those associated with the MVS system control programming. RACF requires approximately 73K bytes of virtual storage.

Scheduled for first shipment this fall, the package will be available under license for $875/mo.

VCI Systems Get CICS Accounting

CHERRY HILL, N.J. – Detailed transaction-level accounting on a daily basis is said to be available to users of IBM's Customer Information Control System (CICS) through the facilities of a CICS Input Subsystem introduced by Value Computing, Inc. (VCI) for its System 1 and Comput-a-Charge packages.

While the daily figures allow billing for current use, year-to-date figures – also accumulated and reported by the VCI software – should provide users with the perspective needed to stay within budget or to modify budget figures if they prove to be unrealistic, the vendor said.

Terminal and line usage, still another range of information available with the CICS Input Subsystem, is shown on weekly, monthly, quarterly and annual bases. This can be a "great aid" to an installation optimizing its terminal network, VCI added.

Applicable to CICS operations under DOS, OS or the VS equivalent, the subsystem interfaces with IBM's Field Developed Programs (FDP), CICS Analyzer Performance Analyzer and – for CICS/VS – Analyzer II. No changes were made in either CICS or the operating systems, according to VCI.

The VCI enhancement package is available to existing System 1 or Comput-a-Charge sites for $2,150. The fee for others is $2,500.

System 1 ranges from $4,500 to $5,500, while Comput-a-Charge costs $6,800 to $8,000. IBM's FDPs costs $70/mo for 12 months.

VCI is at 300 VCI Building, W. Marlton Pike, Cherry Hill, N.J. 08075.

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T/S Net Adds AR/70

MISSISSAUGA, Ont. – Accounts receivable processing has been added to the library of programs available through the remote-computing network of Canada Systems Group (CSG).

Other applications in the library include accounts payable, financial planning, general ledger, payroll and inventory control, according to a spokesman.

The receivables capabilities implemented by CSG are those of the AR/70 package developed by Computer Systems & Education Corp. of Hartford, Conn., and now marketed by Management Science America of Atlanta.

AR/70 supports both open-item and balance-forward accounting and several methods of cash removal, the company said.

Proper handling of repeating transactions and revolving charges, monitoring of unearned discounts and past-due accounts and production of such miscellaneous items as dunning notices and mailing labels are also part of the AR/70 approach.

Based on a pair of IBM 370/168s at a data center here, CSG service is available coast-to-coast through the facilities of the Bell Canada Data Route. Users in or near cities served by Data Route can reach CSG directly; others face toll charges to the nearest entry point, CSG said.

The accounts receivable support is available for an installation fee of $1,000 which covers user education, installation aid and royalty-loaded service charges for system resources actually used. There is no minimum monthly fee, the spokesman added from 2599 Speakman Drive, Mississauga, Ont. L5K 1B1, Canada.

Univac Extends 'Cade' Software

BLUE BELL, Pa. – A software enhancement which extends the data entry capabilities of its 1900 Computer Assisted Data Entry (Cade) system has been added by Univac.

The enhancement, known as File Inquiry Technique (FIT), also provides multiple access to large data files and enables user departments to access related files from local keystations, the company said.

16K Bytes Required

Other features of FIT include Cobol program access to batches and files; added Cobol language capabilities said to minimize memory utilization, increase disk storage efficiency and improve programming flexibility; supervisor file management facilties; and operator mode for file inquiry and update.

FIT requires a minimum of 16K bytes storage, depending on the number of active keyboard, record size and associated application packages.

Univac has also added 8.8M-byte disk units to 1900 Cade to provide a total of 35.2M bytes on-line. Prices for the disk units vary from $315- to $487/mo, including maintenance.

For systems with main memories greater than 64K each 8K module costs $96/mo.

Delivery of both FIT and the larger capacity disk units is planned for January.

Inexpensive 'Tics' Eyes Tape Libraries

COLUMBUS, Ohio – Working with a disk-based file built from operator-provided data, the Tape Inventory Control System (Tics) from Applied Financial Technology, Inc. (Aftek) manages magnetic tape libraries for users under DOS.

Tics was designed to handle production, test and scratch tapes separately. It lists tapes to be scratched and also monitors the number of times specified tapes have been used.

Handling of production tapes includes generation shifting and tentative assignment of expired tapes to the scratch pool. Once that assignment has been confirmed by the librarian, the tapes are available for other use, Aftek noted.

The integrity of test files is maintained, a spokesman added, by assigning each one a unique owner code and expiration date.

Written in IBM Assembler, Tics runs under DOS on any IBM 360/370 that supports direct access storage devices. The internal logic of the program takes less space than the IBM sort it invokes to organize the reports, Aftek said.

The package costs $2,000 and can be ordered from 42 E. Gay St., Columbus, Ohio 43215.

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A presentation for management and technical personnel. Topics covered include Database Concepts, Database vs Traditional Techniques, CODASYL and its impact, IDMS Concepts, Database and Design and Programming Concepts. In addition, competitive systems, conversion, and cost justification topics will be touched. This Seminar should be of value to anyone considering implementing applications using a database approach.

Cullinane Information System 1:00-3:00 p.m.

An introduction to the direction the Cullinane Corporation is taking in providing their clients with a complete information system. Cullinane developments include a Data Dictionary, The SHADOW II Communications Monitor, On-Line Query System, Distributed Data Processing and Mini-Computer versions of IDMS. Also covered will be the CULPRIT Retrieval System and user department versions such as EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER.

Social 3:00-4:00 p.m.

Opportunity to discuss specific questions in depth with members of the Cullinane Corporation Technical and Management Staffs in a relaxed and casual environment.

Seminar Leaders

Robert J. Davis — Mr. Davis is Regional Marketing Manager for Database Systems. He has extensive experience with most aspects of database system design and usage, and has held key positions with both IBM and CINCOM. He is responsible for the marketing of database products in the U.S. and Canada, analyzing competitive products, and finding new markets for database technology. Mr. Davis holds a B.S. degree from the University of Akron.

William R. Casey — Mr. Casey is Vice President responsible for customer education. His responsibilities have included technical development work on the IDMS database management and CULPRIT retrieval systems, customer support, documentation, and consulting functions as well as database training. He is the author of several articles on database and has been a lecturer on database systems for both Advanced Management Research and Management Education Corporation seminars.

James G. Blake — Mr. Blake is National Marketing Manager for the Cullinane Corporation having responsibility for the CULPRIT family of products including EDP-AUDITOR and EEO-AFFIRMATIVE ACTION REPORTER. Prior to joining Cullinane Corporation, Mr. Blake held several key positions with IBM Corporation. His responsibilities at IBM centered on small and medium-sized computer configurations, giving him an in-depth exposure to a wide range of commercial applications.

Where To Go

San Diego, CA	Aug. 3, 4
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Dallas, TX	Aug. 17
Portland, OR	Aug. 17, 18
Indianapolis, IN	Aug. 18
Des Moines, IA	Aug. 19
Seattle, WA	Aug. 31/Sept. 1
Kansas City, MO	Sept. 7
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Pittsburgh, PA	Sept. 13
Baltimore, MD	Sept. 13
Nashville, TN	Sept. 14
Washington, DC	Sept. 14
New York, NY	Sept. 14
Louisville, KY	Sept. 15
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Richmond, VA	Sept. 16
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Proposed Programming Method Assumes Goals More Important Than Structures

By Richard J. Cichelli
And Martha J. Cichelli
Special to Computerworld

The current commotion over structured programming (SP) seems, at best, overdone.

Concepts and Techniques

SP is frequently presented as a set of coding rules, most of which begin with the word "don't." The SP messiahs insult what were thought to be well-designed programs with finger-pointing "GOTOs! Tsk, tsk."

If there is practical validity in the SP philosophy, its rules must be reformulated positively in terms of "dos" satisfying the request, "Show me how to do it better."

We propose "goal-directed programming" (GDP) as a positive, consistent, integrated design philosophy incorporating both SP and top-down design principles. For the experienced programmer it is a guide to proper design; for those who have never written a line of code, it is a way to understand and participate in program design.

The programmer's job is to design and specify an algorithm to accomplish a task. The resultant algorithm will be composed of primitive operations on data called function code (e.g., MOVEs in Cobol, assignment statements in Fortran) and control code which determines whether, or how many times, function code is executed (IFs, PERFORMs, DO-loops, GOTOs, etc.)

SP theory tells us the control code should be formulated from D-structures (Dijkstra's sequence, if-then-else and while-do). Assume we have a language with these and a few extensions (case, repeat-until, for, etc.).

Are they sufficient for good programming? If so, how do we get from the problem specification to a proper program solution?

We need a problem-solving technique which transforms problem specifications into program code.

An Example

Let us say we wish to copy a "sentence" or sequence of characters ending with a period. A structured program in a PL/Esperanto (with D-structures) to do this simple task might look like:

```
REPEAT
   CALL READCH(CHAR)
   CALL WRITECH(CHAR)
UNTIL (CHAR = PERIOD)
```

How do we get from the goal "copy a sentence" to the code? Since we know a sentence is a sequence of items, we need repetition to process the items. Every iteration needs a termination. (Otherwise we loop forever!)

The design process in outline is:

Goal: Copy a sentence.

Assertion: When the sentence has been copied, the period will have been processed.

Condition: (CHAR = PERIOD).

From the goal we derive an assertion that is affirmed when the goal is achieved. From the assertion we derive a logical condition that is true when the assertion becomes true.

This logical condition forms the termination condition of our iteration code. At this point in the design the program would look like this:

```
      REPEAT
copy a character
 UNTIL (CHAR = PERIOD)
```

"Copy a character" can then be elaborated in place into the more primitive:

```
CALL READCH(CHAR)
CALL WRITECH(CHAR)
```

How does GDP lead to the top-down design of structured programs? At any level of problem decomposition certain subproblems may be solved by the available primitives while others must be further factored into subgoals and their corresponding subproblems.

GDP design is an elaboration of the problem-solving process; it tends to be top-down because human problem solving tends to be top-down.

Since the top-level code is user problem-oriented, user participation during the crucial early stages of system design is facilitated. Design and coding take place simultaneously. Traditional flowcharts, at best a poor design tool, can be eliminated.

GDP develops with an intuitive and natural structuring. Each goal is expanded in place. Since no goal is satisfied by "going" somewhere else, there is no temptation to create spaghetti-like control code.

Control code is separated both logically and syntactically from function code; it is created immediately from the logical conditions derived from the goals and is coded before the function code implementing the goals.

Of course, the function code may itself contain control code. Proper nesting of control structures is ensured by the top-down order of the design-coding process.

Data Structure Design

What about the design of data structures? For every goal-problem we can apply the goal-assertion-condition transformation.

The concepts of goal-directed programming (GDP) presented here will be illustrated in the next article by the Cichellis, using Edgar Dijkstra's "silly program": given two routines, READCH and WRITECH, and an input sentence, copy the sentence so that extra blanks are eliminated and every other word is written backwards.

If the overall problem statement is our first goal, these transformations will lead directly to a top-down design of the program. The same top-down process should be applied to designing a problem's data structures.

Proceeding from the most general statement of the problem leads directly to treating the most general or inclusive data structures first. To process large compound data structures we decompose them into smaller components and then process the components.

Processing a mailing list file, for example, requires decomposition of the file into records and the records into name and address lines, etc.

There is a direct correspondence between D-structures and data structures. Records are made up of sequences of elementary data items and of structures. These structures may contain iterated parts or alternative component parts. Data structures are most appropriately processed by their corresponding D-structure.

Code sequences or blocks process aggregates of items of different types; WHILE and REPEAT loops process sequences of items of the same type; and CASE and IF selectors process alternative parts.

Richard Cichella is research manager of computer applications at American Newspaper Publishers Association/Research Institute in Easton, Pa.; Martha Cichelli is a partner in Software Consulting Services, Allentown, Pa.

Assembler Users 4K On CA Millicomputer

IRVINE, Calif. -- Computer Automation, Inc. (CA) has introduced an Assembly language package designed to function in 4K 16-bit words with the company's LSI-3/05 Millicomputers.

The Omega 3/05 is an assembler/editor combining the features of a conversational source program editor and a two-pass assembler, which enables users to perform interactive editing via a teletypewriter keyboard, CA said.

In-Memory Work

The software provides in-memory program assembly and maintenance; both updated source programs and object code can be punched onto paper tape, according to the vendor.

The software is available for $140 from CA at 18651 Von Karman, Irvine, Calif. 92713.

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Definition of DTE Interface Crucial

Adoption of X-25 Could Signal New Era of Problems

By Louis Pouzin

Special to Computerworld

A major benefit of the work to produce a single standard data link control procedure is the potential ability to exchange data between equipment of mixed origins.

It is fundamental that such a major achievement be maintained and expanded when new communications media become available.

The standardization of Higher Level Data Link Control (HDLC) will foster the development of communication products implementing transmission procedures in hardware or firmware. This evolution will bring substantial savings in production and maintenance costs and will reinforce stable HDLC codes of practices.

These considerations lead to a policy of strict conformity with the HDLC standard whenever it is applicable without penalty in cost or efficiency.

The data terminal equipment (DTE) interface will gradually become a part of the hardware or firmware. Thus it is essential the DTE interface remain unchanged. Interface variations depending on national options or differences in communication media would be detrimental to the user interest.

A DTE equipped with an HDLC interface should require no modification when it is inserted in different configurations (point-to-point, multipoint) or connected through different communication media (permanent or switched, analog or digital, half- or full-duplex).

A violation of that requirement would lead to a growing number of specialized DTE interfaces and work against standardization.

The HDLC procedure has been designed to operate on a variety of communication media capable of transmitting frames. Transit delay, bit rate and error rate may vary. The span of normal variations is covered by a proper adjustment of the HDLC procedure parameters.

However, the communication medium must meet a particular requirement to deliver frames in sequence. In other words, it should behave as a circuit.

Circuits may be implemented with many different techniques: permanent, switched, wires, frequency channel, time slots, radio, microwave, satellite, modulation, pulse coding, etc.

The circuit interface is the same, regardless of the physical implementation which does not interfere with HDLC.

Virtual Circuits

A facility called "virtual" circuit has been introduced in recent developments of public transmission networks. This facility provides a point-to-point transmission service on switched or permanent virtual circuits.

As opposed to "real circuits," their interface is designed only for the transmission of packets, following the rules of a specific transmission procedure which does not conform to HDLC.

Virtual circuits, as defined in the CCITT draft recommendation X-25, introduce incompatibilities which cannot be resolved without additional complexity and cost to the user.

- A DTE working in X-25 cannot communicate with a DTE working in HDLC.
- DTEs working in X-25 cannot communicate except through a public virtual circuit facility.
- Public virtual circuits do not allow access to DTEs working on X-21 and HDLC standards.
- There is no provision to access DTEs through a switched-circuit facility.
- There is no datagram facility.

In summary, X-25 will lead to a variety of DTE interfaces depending on the configuration in which they will be inserted, e.g.:

- HDLC to HDLC.
- X-25 to X-25.
- HDLC to X-25.
- DTE calling through a switched-circuit network.

This proliferation of interfaces would be detrimental to the user interest and would create difficulties or impossibilities to communicate between DTEs located in different countries or attached to different networks.

An analysis of X-25 shows functions placed at the packet level are somewhat redundant with those found at the X-21 and HDLC levels. They are also a major source of incompatibilities with HDLC DTEs and switched-circuit networks.

Further analysis shows all functions found at the packet level of X-25 can be performed as well at the HDLC level. Should this approach be taken, a number of advantages would result:

- A single universal HDLC interface.
- Compatibility between DTEs regardless of the communication media.
- Compatibility between DTEs attached to private or public networks.
- A datagram facility without additional complexity.
- Reduced processing overhead at the DTE interface.
- Reduced number of packet sizes at the DTE interface.

The present X-25 recommendation is a major concern as it introduces a new area of incompatibilities. On the other hand, all functional aspects of X-25 can be covered by a proper use of ot HDLC.

The simplification and generality resulting from the definition of a universal DTE interface is so important it is recommended the International Standards Organization (ISO) and CCITT undertake without delay a revision of X-25.

Pouzin is director of the Cyclades experimental packet-switched network in France.

AM Helps Banks Face Two EFT Realities

By Ronald A. Frank

Of the CW Staff

CLEVELAND – Users who install bank terminal equipment from nonmainframe vendors always face the reality that their terminals must remain compatible with the mainframe. They also face the problem of consumer acceptance.

One way terminals can transmit data to a CPU is through a terminal subsystem controller. And if this controller is a programmable device with software supplied by the terminal vendor, the user has some assurance the terminals will remain compatible.

Addressograph-Multigraph Corp. (AM) here has used the terminal subsystem approach with its bank terminals that are configured as part of a Financial Transaction Delivery System.

The system is currently being used in various check-cashing and electronic funds transfer (EFT) applications. At the center of this system is the AM 7300 and AM 7500 controllers. The controller is an Interdata or other mini that serves as a switch for remote terminals operating at multiple transaction locations.

The company began by simply supplying terminals to banks, but decided bankers did not have the in-house capability to design their own data communications systems, according to Jan Van Gorder, marketing manager for terminal systems.

As a next step, the firm began to offer terminal subsystems with software that would interface the subsystem to the user's CPU. These terminal systems are now operating in various protocols with IBM and Burroughs mainframes, emulating IBM 3270 and 2260 and Burroughs TC 700 terminals.

Consumer Key to EFT

But emerging technology is not the reason for the relatively slow acceptance of EFT systems, according to Victor Levadi, AM's director of terminal systems. The limitations are sociologically oriented; consumer involvement is a big factor in the success of the EFT systems, Levadi said.

AM is currently implementing a supermarket check-cashing system in the Atlanta area that allows customers to validate their own checks. Using a self-service version of the Amcat terminal, the customers can get a validating stamp put on their check so there will be no delay when they pay for their groceries.

At present the system is on-line to a local bank which processes the validation inquiries through its customer data base to ensure the customer has a valid account. But an easy next step would be to perform a monetary transfer from the customer's account to the store's account when the check is presented to the terminal for validation, Levadi indicated.

Thus far the Atlanta system has been well accepted and Levadi attributed this to the fact that the customer is involved in the transaction. One customer benefit is that the service fee the many supermarkets charge for cashing a check is eliminated.

Banks will have to become more responsive to consumers if they want to implement successful EFT systems, Van Gorder said. "Consumers are going to be the drivers. You're involving the public where they buy and where they get their money."

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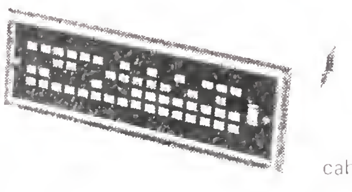

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DP Departments Should Be Used to Trim Phone Bills

By John Dretler

Special to Computerworld

DP departments were founded and still are based on their ability to aid management in reducing corporate costs and increasing efficiency.

This is because of man's ability to make computers manipulate large volumes of data quickly and present this information in a usable format.

It started in general ledger, accounts receivable and accounts payable and has expanded to automatic inventory reorder points, on-line data entry and access and sophisticated financial, marketing and production analysis and modeling.

In summary, it has served as an aid to all major cost and profit centers of business.

Through all this, however, there has been a major cost area that has continued to grow and yet has remained relatively unattended.

It is usually the third or fourth largest corporate expense. Its budget, on the national average, is two to three times the data processing budget.

Rate increases have caused this expense area to grow almost 80% since 1973.

This area is voice communication costs – a company's telephone bill.

Lack of Management

Why has an area like this continued to grow so quickly and remained, in many cases, both uncontrollable and unmanageable? Mostly because business has never applied the necessary tools to manage this expense area.

The telephone expense has always been administered. Once the bill is received, it is logged and then paid.

To manage it required the use of disciplines which most frequently exist in the DP department and nowhere else within a company. Thus, as goes the computer group's interest in voice communications, so goes voice communication costs.

To explain this point, one can quickly look at the average corporate telephone bill. The costs are broken down into two areas – equipment and usage.

The major part of the expense is usage. In the private branch exchange (PBX) environment, usage accounts for 70% of the expense (50% in Centrex systems). It is also the most volatile. It changes both in activity as well as cost from month to month.

The other 30%, equipment, is fairly stable from month to month and should exist only to best serve the usage requirements of a company. As a result, telephone usage is the area that deserves the most attention and creates the biggest problem.

Usage Expense

Usage expense is very much like the general ledger or accounts receivable. It consists of thousands of pieces of data (telephone calls) presented in an unintelligible format (telephone bills) on a continuing basis (monthly).

The person receiving this information in a company is often unaware of where the majority of the activity is, how to minimize costs, what the level of service to the users is, what type of network to install or what level of telephone misuse exists.

However, it would be impossible for the user to do this with a high degree of thoroughness on a monthly basis. The user has that age-old problem of having a lot of data, but not in a usable format to minimize cost and maximize efficiency. To attain these objectives requires continuous manipulation of the information and the analysis of the results.

What DP Does Best

This, it seems, is what DP departments do best. They take volumes of data and present it in a format that enables management to improve its level of operation. If for no other reason, this is why DP departments should become involved in the management of the voice communication expense.

There are other reasons, however. Once the data is generated, network design is the next step. Oftentimes this discipline exists only in the computer group.

Recently, minicomputers and microprocessors have become the mainstay of telephone switching systems. As a result, DP expertise would be extremely beneficial in analyzing different systems and their throughput capability.

The integration of voice and data communications requirements could enable a company to avoid duplication of both effort and cost. (Data under voice is a reality in today's environment.)

And, finally, the most frequent method of system analysis (particularly usage) is software systems to analyze and produce management reports. This is done through obtaining toll and Wats tapes from the telephone company or through ancillary equipment which attaches to a company's telephone system.

As a result, no matter which way the user turns, usage or equipment, the ability to improve efficiency requires DP involvement. The potential benefits can be enormous. The application of this already-existing DP expertise has resulted in savings as high as 30% in many companies.

Dretler is president of Telephone Management Systems, Inc. in Needham, Mass. 02194.

GDC Designs LSI Modem For 9,600 Bit/Sec Users

WILTON, Conn. – General Datacomm Industries, Inc. (GDC) has an LSI modem which features 4,800-, 7,200- and 9,600 bit/sec operation. RS-232C and CCITT V.24 interfaces; and operation over basic 3002 lines.

In addition, the GDC 9601 includes constant monitoring provided by a data lamp, marginal circuit and line signal detector indicators, local and remote testing and voice capability for communications with a remote operator, GDC said.

The 9601 has been designed to offer protection against the total range of impairments on a number of different types of circuits, it added.

Configuration flexibility is provided by strap options, switch-selectable transmission rates and an optional two- or four-port multiplexer, GDC said.

The modem is also designed for point-to-point applications utilizing four-wire circuits and operating full-duplex through a continuous carrier, the company said.

The 9601 costs $7,250, with quantity discounts available. Delivery is in 30 days, GDC said from 131 Danbury Road, Wilton, Conn. 06897.

Putting the minis in their proper places.

Read *Minicomputers and Small Business Systems* in the August 30th *Computerworld*.

The minicomputer market is bullish and booming. Minicomputer shipments will reach approximately $1.3 billion in the U.S. this year -- nearly triple the value of units shipped in 1973 (Source: International Data Corporation, the world's largest EDP market research firm). The fundamental reason for this rapid growth is the mini's declining cost, which has given rise to a wider and wider variety of uses for these versatile machines. Once a creature of the laboratory and scientific environment, minis can now be found doing everything from on-line network control to functioning as CPU's for complete small business systems (many of which are found in very large businesses, as the idea of distributed data processing begins to take hold).

In our August 30th supplement, edited by Esther Surden, we'll be taking an in-depth look at minicomputers and small business systems. Using application stories and tutorials, we'll examine how minicomputers function in distributed processing environments. We'll also have a survey of distributed processing: who uses it, what it is, and where it's headed. We'll analyze current trends in minicomputer development and discuss what the "superminis" have to offer. We'll also present a variety of stories on small business and turnkey systems. We'll examine the different types of systems available, the hardware and software features they offer, and look at how costs compare with benefits for some first-time users converting to a small business system.

Whether you're a giant professional computer site, or one of the smallest first-time users, this report will have important information for you. It's in the August 30th *Computerworld*. If you're a minicomputer manufacturer, a systems house specializing in minicomputer enhancements, or a small business system vendor, you should advertise here. Don't miss the August 13th ad closing. Contact your *Computerworld* salesman to reserve your space. Or call Judy Milford at (617) 965-5800.

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Terminal Transactions

Portable Unit From Termiflex Designed for Mini, Micro Users

NASHUA, N.H. – Termiflex Corp. has introduced a hand-held interactive terminal designed for use with the Intel Corp. 8080-based SBC 80/10 and other mini and microcomputer systems.

The HT/2 communications terminal is a portable but non-battery-powered device which operates on-line to the computer system, according to a company spokesman.

A full, 20-key Ascii character set is complemented by a 20-character, 5 by 7 dot matrix character format LED display with a 1K-character display buffer for scrolling purposes, the spokesman said.

It features switch-selectable transmission speeds of 10-, 15-, 30- and 120 char./sec in a bit-serial Ascii format, he added.

Technical documentation is provided by Termiflex, the spokesman noted.

The HT/2 is priced at $1,775, with a delivery schedule of 30 days, the spokesman said from 17 Airport Road, Nashua, N.H. 03060.

Joysticks Link CRTs With DG, DEC Minis

SAN DIEGO – Megatek Corp. has two Joysticks for interactive computer graphics which provide the operator with interface ability to the CRT through any Data General Corp. (DG) Nova or Eclipse or Digital Equipment Corp. PDP-11 series mainframes.

The Megraphic Joystick models A and B provide the minicomputer interrupts at a 100-Hz rate to allow the operator to position a cursor on the CRT. In addition, Joy B has a user-controlled switch on the end of the stick to provide status information, the firm noted.

Both the Joy A and Joy B are CRT-independent and, as such, are compatible with any CRT operating with the DG or DEC minicomputers, a Megatek spokesman said.

A Joy A, without the status switch, costs $1,150; the Joy B costs $1,300, the spokesman said. Both prices represent sticks for a DG Nova interface and include a software driver, he added.

Megatek is also considering offering special interfaces, the spokesman said from 1055 Shafter St., San Diego, Calif. 92106.

Telxon RAM Device Sends Data Over Regular Lines

HOUSTON – Telxon Corp. has a portable, solid-state random access memory (RAM) terminal designed to record and transmit business information over ordinary telephone lines.

The Telxon 717 features a 24-key keyboard and 12-character Burroughs Corp. Panaplex display, the company said.

A 300 bit/sec acoustic coupler comes with the terminal; couplers with transmission speeds up to 1,200 bit/sec are available as options.

Also offered as standard equipment are a battery pack and 1K byte of RAM, with 2K and 4K characters of memory available optionally, the company said.

The Telxon 717 includes check digit verification, entry counter, memory search and enforced header features. It is priced at $845, Telxon said from 3726 Dacoma St., Houston, Texas 77092.

Syntech Adds Control Unit

ROCKVILLE, Md. – Syntech Corp. has a terminal control unit which is said to reduce the number of computer ports, modems and transmission lines required in a nonpolled, multiterminal network.

The TCU-8 allows one computer port or modem to service up to eight terminals via a time-sharing technique and is cascadable to achieve further efficiencies, the company said.

Terminals can be arranged side by side with the TCU-8 or extended any distance from the unit via conventional or limited-distance modems, Syntech said.

The device reportedly handles transmission speeds up to 9,600 bit/sec and is priced at $995.

Syntech can be reached at 11810 Parklawn Drive, Rockville, Md. 20852.

Lear Has 'Do-It-Yourself' ADM-3

ANAHEIM, Calif. – Lear Siegler, Inc. has a "do-it-yourself" assembly kit for its ADM-3 dumb terminal.

Priced at $875 (as opposed to $1,280 for a factory-assembled model), the dumb terminal kit gives the builder a 24-line, 12-in. screen capable of displaying 1,920 characters at 80 char./line. The standard set is 64 Ascii characters generated by a 5 by 7 dot matrix displayed as upper case, plus punctuation and control.

The kit comes with two basic assemblies: the CRT section which is premounted in the cabinet, and the display electronics section, with keyboard control and power supply also premounted.

The printed circuit board has sockets ready for installation of all integrated circuits.

The user reportedly can assemble his dumb terminal using basic tools: soldering iron, needle-nose pliers, wire cutters and a screwdriver Illustrated instructions are said to provide straightforward, step-by-step procedures.

Owners will connect the dumb terminal to their own micro or miniprocessor or using an acoustic coupler, call a remote computer.

The ADM-3 will replace a teletypewriter, offering software compatibility through both a switch-selectable 20-mA current-loop interface and the EIA standard RS-232C interface for direct connection to a computer port. For hard copy, an optional auxiliary extension RS-232C port for interfacing a serial asynchronous Ascii printer is available. This port will also interface with a tape recorder or other data terminals.

Lear Siegler is at 714 North Brookhurst St., Anaheim, Calif. 92803

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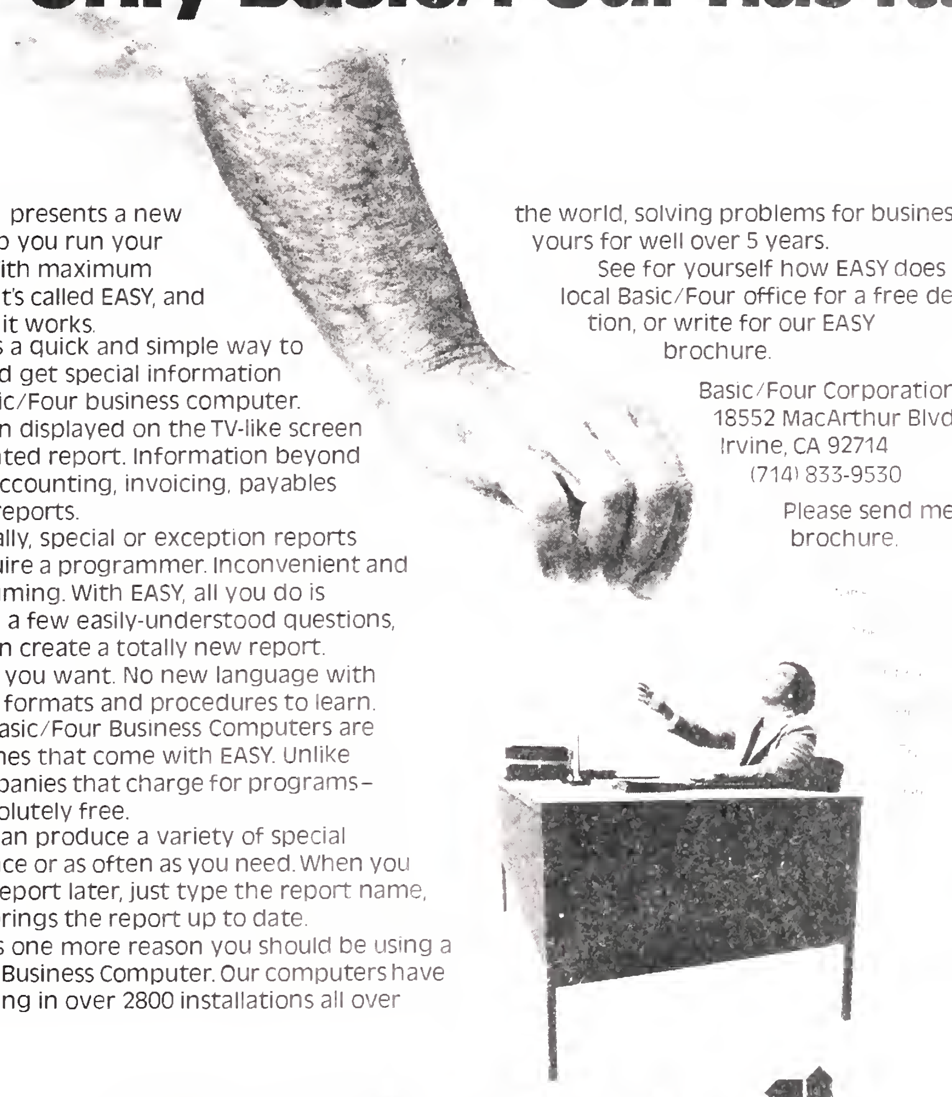

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Bits & Pieces

NBS Extends Calibration To High-Density Surfaces

WASHINGTON, D.C The Institute for Computer Sciences and Technology of the National Bureau of Standards (NBS) has extended its unrecorded low- and medium-density magnetic disk calibration services to include high-denstiy (12-disk pack) data surfaces.

Each high-density data surface submitted will be calibrated with respect to the primary standard reference data surface established and maintained by NBS, the institute said. Submissions will be calibrated at both 1.6- and 3.2 mHz on tracks 000 and 410.

The cost for this service is $325. Additional information is available from the Data Acquisition and Storage Section, Computer Systems Engineering Division, Room B-212, Building 225, NBS, Washington, D.C. 20234.

Printer Controlled by Micro

WAKEFIELD, Mass. – Dataroyal, Inc.'s IPS-7 Intelligent Printing System is a bidirectional matrix printer controlled by an Intel 8080A microcomputer and designed for OEM and systems applications, according to its vendor.

The printer, which can be used with minis, micros and large systems, features standard parallel interfacing, making the unit plug-to-plug compatible with other matrix printers, Dataroyal said.

Options include EIA RS-232 or 20mA current loop interfaces with error checking, variable-sized alphanumeric characters and bar code features, the firm said.

The IPS-7 is modular, a spokesman noted. When a user buys the printer, all necessary hardware is already incorporated into the unit: options are added by plugging in additional electronics, he explained.

A IPS-7 printing one-size 1/9-in. high character with a parallel interface and 5 by 7 character font costs $2,175, the spokesman said, with other configurations available at increased cost. Dataroyal is at Main Dunstable Road, Nashua, N.H. 03060.

ADI Add-On Disk Fits PDP-8

CHATSWORTH, Calif. An add-on head-per-track disk memory system for the Digital Equipment Corp. PDP-8 minicomputer has been introduced by Alpha Data, Inc. (ADI).

Capacities of the ADC-8 can range from 212K words to 2M words with an average access time of 8.4 msec, ADI said.

The memory system costs $6,800 each in quantities. ADI is at 20750 Marilla St., Chatsworth, Calif. 91311.

Take 'Winchester' One Step Further

CDC Disks Increase 370 Users' Storage

MINNEAPOLIS – Control Data Corp. has introduced what it said is an advancement in the "Winchester" data module disk storage technology for users of IBM 370 computer systems.

The CDC 33801 family of disk subsystems increases the storage capacity of a single-disk drive to 400M bytes of data that can be accessed directly by the CPU, the company said.

The subsystems provide 800M- to 12.8M bytes of data storage and require a single CDC 38302 disk storage controller, according to the company.

The CDC 33801 subsystems can be used with IBM 370 systems under the control of OS, DOS OS/VS and DOS/VS and require no software modifications, the firm said.

Each 400M-byte drive appears as two logical CDC 33302-11 (IBM 3330-11) disk storage units of 200M bytes each. Fixed-head storage on three models (the A2F, B2F and C2F) is contained on the first of the two logical volumes, according to a spokesman.

Each drive unit in the disk subsystem series includes recording disk, read/write heads and head arms in a sealed unit for protection of recorded information, CDC said.

Data is transferred at a rate of about 1.2M byte/sec; average data access time is 25 msec.

Each disk storage unit consists of two drives and one to four units can be configured in a single string. Up to four strings – 32 drives – can be attached to the universal CDC 38302 storage control unit, the company added.

Drive units are available in six models. The 33801 A2 and A2F with fixed-head storage contain two drives, data modules and associated control logic. These attach directly to the storage control unit.

The models B2 and B2F also include two drives and modules. Up to three of these units can be attached to a single A2 and A2F, according to CDC.

Alternative control logic is provided with the two-drive C2 and C2F units that connect to the 38302 storage controller. This alternate logic can be manually selected as backup for the A2 and A2F models, the firm noted.

Control Unit Features

CDC's 38302 universal storage control unit is used with the 33801 disk subsystems. The 33801 units can be intermixed on the same controller with CDC 33301, 33302 and 33401 or equivalent disk products.

This capability also enables the 33801 subsystems to serve as staging devices for CDC 38500 mass storage systems, the company noted.

Purchase price of a Model A2 disk storage subsystem is $44,840 or $1,180/mo on a three-year lease. The Model B2 costs $35,910 or $945/mo.

The C2 with manually activated control logic is priced at $46,360 or $1,220/mo.

The three fixed-head storage units in the 33801 family carry purchase and lease prices of $57,000 or $1,500/mo for the Model A2F; $48,070 or $1,265/mo for the B2F; and $58,520 or $1,540/mo for the 33801 C2F.

Prime shift maintenance charges range from $150/mo to $260/mo; initial deliveries of the disk subsystem family will be made next summer, CDC said from Minneapolis, Minn. 55440.

Burroughs Input/Display Units Work With All of Firm's CPUs

DETROIT Two input and display systems introduced by Burroughs Corp. are said to provide users with a choice of methods for displaying data, communicating with a CPU, entering data at remote locations and receiving and storing data for remote display and printing.

The TD 730 and TD 830 can be equipped with a variety of keyboards and peripherals devices including cassette tape stations, magnetic card readers and printers, the firm said..

Both systems can be used with the entire range of Burroughs computer systems, a spokesman added.

The TD 730 uses the Burroughs Self-Scan II panel which displays up to 480 characters in 12 lines of 40 characters each. The screen can be configured to provide 256 characters in eight lines with 32 char./line.

The TD 830 uses a compact CRT which can display up to 2,000 characters, Burroughs said. Screen format consists of 24 lines or 80 characters each for data and another line of 80 characters to display system status.

The TD 830's memory can be expanded to a total of 4,080 characters and can be divided into multiple pages for display puposes. A buffer feature allows data to be entered by the operator on one page while communications of peripheral data can be received on or transmitted from another page, Burroughs said.

Both the TD 730 and TD 830 can blink a designated character or characters to accent data and "secure video," a technique which allows security data to be entered and transmitted but not displayed on the screen, the spokesman explained.

The editing capabilities of the two systems provide a variety of methods for data correction and update, Burroughs said, noting information can be changed by character, line, field and page.

A special search mode is also provided to the system to automatically position the cursor over a designated error character, the firm said.

A page roll up/down feature causes the data on a page to roll up or down while the cursor remains in a fixed position. A scrolling feature allows the contents of data memory to be displayed sequentially without regard to page boundaries, according to Burroughs.

Each system incorporates a status display which indicates existing or previous system error conditions, cursor page number and a data field for central system status messages. On the TD 730, two display lines are used alternately for data and system status.

Peripheral capabilities for the two systems includes a matrix printer tha operates at 60 char./sec and line printers that operate at 85-, 160- and 250 line/min. Each auxiliary printer may be shared by up to three TD systems, Burroughs said.

A typical TD 730 and 480-character Self-Scan II panel costs $3,635 with a one-year lease rate of $115/mo. A typical TD 830 has a purchase price of $4,285 and a one-year lease rate of $135/mo.

Deliveries will begin in the third quarter from Burroughs at Burroughs Place, Detroit, Mich. 48232.

Skandia Insurance Covers DP Misuse

STOCKHOLM, Sweden – The Skandia Insurance Co. Ltd. is offering insurance protection against computer misuse and its associated capital loss.

Intended primarily for companies which furnish DP services to other firms, the insurance is also available to companies which have their own DP operations. Coverage ranges from property to legal protection insurance.

A premium is set according to value of the property, type of building, location and other factors, including the number of employees, salary of employees and size of the deductible, the firm said.

Skandia, a member of the Skandia Group, can be reached at Box S-103 60, Stockholm, Sweden.

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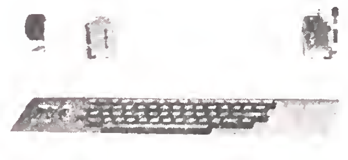

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In the Used Market—Part 1

Sale of CPU Involves Series of Steps

By Sonny Monosson
Special to Computerworld

Used computers are not junk but a high-value business asset. Purchases in the used equipment market, therefore, are a serious alternative for the user interested in a good cost-performance upgrade and concerned about getting the most out of expanding his present line of equipment.

An absolute first step in consideration of the sale of any used computer is to check the investment tax credits taken on the equipment and the contingent tax liability that may occur with resale.

There are cases in which credits taken must be repaid to the Internal Revenue Service if the equipment is sold too soon after purchase.

Some owners of equipment have used a "test of market" as input to their own decision on equipment disposal. This offering of equipment for sale is basically to determine its value.

But the "test of market" is frequently quite frustrating to all parties involved, particularly to the possible seller. Offers often evaporate into thin air when it's time to sign a purchase and sale agreement.

A less costly and more responsive answer may be obtained by soliciting the services of an independent appraiser. Organizations involved in the used computer market often will provide a professional appraisal of the market for the equipment.

Extremely accurate appraisals are difficult, however, even for the "experts," because of thin markets for many types of equipment. In addition, the characteristics of the used computer marketplace are totally different from those of the new.

Used computer values are not based on the intrinsic value of the equipment. The age of the equipment, for example, is a relatively insignificant factor in establishing current or continuing fair market value – at least where the so-called thin markets exist.

Such price degradation must certainly be anticipated where the equipment configuration is of a highly specialized character. The seller is likely to encounter zero interest in major portions of a specialized system offered for sale – and this lack of interest will correspondingly force used values to zero.

The organization selling a machine originally manufactured by a defunct company and with no maintenance alternatives will also encounter similar severe drops in value.

But such considerations are often of little concern to the buyer – whether of new or used equipment – for the intrinsic value of the system to him is a major criterion against which he weighs his original acquisition.

A lending institution accepting such equipment as collateral, on the other hand, has a considerably different viewpoint. If it becomes necessary to foreclose, such equipment must generally be resold in order to recover at least a portion of the principal.

Time to Sell?

An organization which desires a trouble-free transaction in either purchase or sale must take particular cognizance of scheduling the transaction – particularly in the case of disposal of equipment.

Waiting until equipment usage has ceased, whenever that is, before offering it for sale tends to depress its value, whereas immediate delivery or at least a firm commitment for delivery on a fixed date – is required for actual sales activity to occur.

When equipment will not be available within a reasonable period of time (four months at most), the seller will probably find attempts at sale either directly or by broker activity are frustrating.

Dealers, however, may be found willing to estimate future values and buy on speculation that the equipment will retain some value over a period of time.

The user, in any case, must be prepared to transfer the title precisely as agreed or pay the previously established penalties for any delays.

On the other hand, the user should not wait until he turns the machine off to offer it for sale. The machine should be offered for sale at least two months before it's no longer needed. This allows time for the sales activities, such as advertising, financing, negotiation and shipping.

Part II will discuss maintenance and how it affects the prices of used equipment.

Monosson is a past president and now chairman of the Computer Dealers Association and is president of American Used Computer Corp.

CMI Add-On Memory System Offers 8M Bytes to IBM 370/168 Users

BEDFORD, Mass. – An add-on memory system designed for use with IBM 370/168 computers is being offered by Cambridge Memories, Inc. (CMI).

Designated the 370/Stor 168, the system can be expanded from 1M bytes to 8M bytes in 1M-byte increments, the vendor said.

Compatible with all IBM 370/168 processor models, the CMI memory is transparent to all IBM-supplied programs and operating systems software as well as to microcode and maintenance diagnostics, the firm added.

It can operate within multiprocessor systems with no system degradation because the 370/Stor 168 uses N-channel static memory devices rather than dynamic devices, CMI said.

"The constant recharging of dynamic devices increases the chance of single-bit errors, but the N-channel MOS chips used in the 370/Stor 168 system are able to hold their charge without refreshing," a spokesman explained.

Any failing 1M-byte partition can be determined by the system operator with a customer panel included in the system; an off-line switch aids problem detection by allowing all of the CMI-supplied memory to be removed, leaving IBM-supplied memory functioning, the firm said.

Maintenance Panel

A maintenance panel is also included which provides problem determination capabilities down to the modular board and single-bit levels and allows problems to be diagnosed and corrected off-line.

Single-bit errors are automatically detected and corrected by failure-anticipation circuitry built into the system, and multiple-bit errors are automatically detected, after which the system supports the software error checking and retry facilities of the 370/168 central processor.

The system can be purchased for $125,000 per megabyte. A 36-month lease plan costs $4,100 per megabyte plus $400 maintenance. Delivery is 30 days from the firm at 12 Crosby Drive, Bedford, Mass. 01730.

Graphic TV Monitor From Grinnell Lets User Design Display Format

SANTA CLARA, Calif. – Grinnell Systems Corp. has a graphic television monitoring system that reportedly displays real-time process data and annunciation information in user-designed formats with or without a computer.

The GIR-2 works with standard television monitors and needs 256 or fewer picture generation instructions, Grinnell said.

In computer-based applications, the GIR-2 takes up little core memory; without a computer, picture format, grid and annotation instructions are stored in programmable read-only memories, according to the firm. Data display instructions are then supplied by the real-time data stream.

The GIR-2 generates a picture on a 256-element by 256-line matrix using alphanumerics, graphic rectangles and scale grids. Alphanumerics can be displayed in four sizes, including the 64-character Ascii set plus as many as 63 user-specified symbols; up to 450 characters can be displayed simultaneously, a spokesman noted.

The GIR-2 system consists of a controller and one or more display channels. The controller includes the control logic, a power supply, a 19-in. rack-mount chassis and a standard 16-bit interface. Other interfaces are available.

Prices for a GIR-2 controller and one display channel start at $4,950 from Grinnell at 2986 Scott Blvd., Santa Clara, Calif. 95050.

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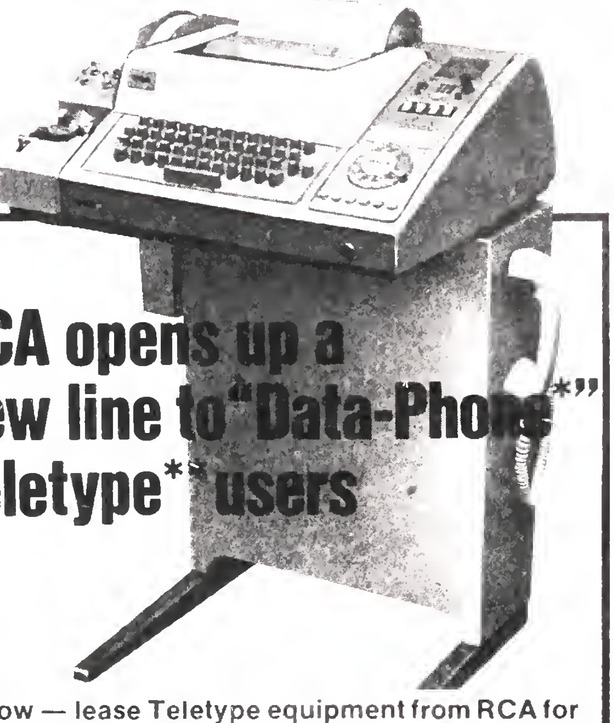

RCA opens up a new line to "Data-Phone*" Teletype** users

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Mini Bits

Mini/Micro Conference To Cover Range of Topics

SAN FRANCISCO – Memory peripherals, OEM peripherals in end-user systems, microcomputer selection criteria, minicomputer maintenance, computer law and financing a growth company in today's environment are some of the topics to be covered Oct. 19-21 at the 1976 Mini/Micro Computer Conference and Exposition here.

In addition to sessions, a special "paper day" has been set for Oct. 21 to focus on individual papers not necessarily related, according to a conference spokesman.

Over 75 companies are scheduled to exhibit, including Digital Equipment Corp., Microdata Corp., Interdata, Inc., Diva, Inc., Intel Memory Systems and National Semiconductor.

The conference and exposition will cost $40 for the three days or $15/day. Exhibitor guest passes will be good for the conference and exposition.

Additional information can be obtained from Robert D. Rankin, 5544 E. LaPalma Ave., Anaheim, Calif. 92807.

Basic/Four Users Organize

DUARTE, Calif. – A group formed "to improve programming and promote an exchange of ideas" among Basic/Four users has been formed in southern California, according to the group's spokesman.

The group is open to owners and users of Basic/Four equipment. A monthly newsletter will be published for group members and periodic meetings and seminars are planned to "promote more effective DP operations," the spokesman said.

Basic/Four owners interested in joining the Western Basic/Four Users Association should contact Larry Hanks, President, P.O. Box 217, Duarte, Calif. 91010.

Papers on Micros Sought

OKLAHOMA CITY, Okla. – Prospective authors are invited to submit abstracts of papers to the Microcomputer-77 Conference and Exposition to be held here next April 6-8.

The conference is sponsored jointly by the University of Oklahoma and the IEEE Computer Society.

The conference will focus on microcomputer systems with a survey of the range of current applications and an exploration of potential areas for future development.

Deadlines are Oct. 1 for abstracts and Dec. 1 for papers. Additional information can be obtained from Dr. S.C. Lee, School of Electrical Engineering, University of Oklahoma, Norman, Okla. 73019.

As Firm's Business Doubles

Turnkey Keeps Dealer Out of the Woods

By Esther Surden

Of the CW Staff

DALLAS – A turnkey minicomputer at a wholesale distributor to the lumber business here has coped with this company's increased growth, according to a spokesman.

"In the last year [before installing the system] we have almost doubled our business, and it was either go to a computer or hire additional clerks to sit at additional typewriters and bookkeeping machines," Steve Baker, accounting manager for Dallas Wholesale Builders Supply, Inc. said.

The company has sales in excess of $1 million/mo of materials such as panels, moldings and doors. It has about 500 customers ranging in location from the Gulf of Mexico to Oklahoma, he added.

The firm made the decision to look for a minicomputer because Baker felt a small system would fit the size of the business. A minicomputer also "offered a lot more to us than a batch system associated with larger scale computers," Baker said. A real-time environment was a must, he noted.

Primary Needs

The primary applications the company needed on the system immediately were billing and inventory, so the firm searched for a system suited to its needs. Finally, a turnkey mini dealer with systems in the wholesale distributor's area came to the company's attention.

"The software it had at that point in time was basically what we needed, with some enhancements in some areas," he said. In addition, the Data General Corp. (DG) hardware used in the Electrofile, Inc. configuration seemed to be a good choice.

Complete Turnkey

The system was installed as a complete turnkey from Electrofile. It includes a 32K-word DG Nova, disk, a teletypewriter, three CRTs and two printers. One of the printers, an 80 char./sec model, is used exclusively to produce delivery tickets. All the programs are written in Fortran running under DG's Disk Operating System, he added.

Prior to acquiring the automated system, the firm had been using an Olivetti bookkeeping machine, he continued.

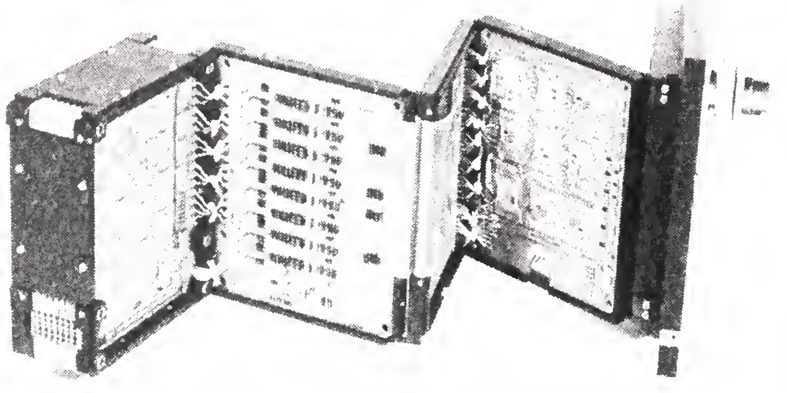
The system now handles receivables, payables, inventory, purchasing, historical sales reports and order entry. The company has about seven inside and seven outside salespeople and, when orders are taken, they code an order sheet, from which the orders are then entered into the system. The historical sales data presents management information such as the percentage of profits and breaks the information down by salesperson.

Within a Month

The installation was up and running with invoicing and billing within a month after the computer was installed, he continued. This was a big factor in its choice, since the crunch of added sales was bogging down the firm's turnaround time.

All the system components are known manufacturers' equipment, he said, so the risks in deciding on a turnkey system were minimized. The company also "checked the background" of the turnkey house before the purchase to assure it was a solid company, Baker noted.

Minis to Probe Cosmic Secrets



The CDC system is hinged like an accordian.

MINNEAPOLIS – Three 6-1/2-lb computers at the helms of astronomy observatories to be launched between 1977 and 1979 will help the National Aeronautical Space Administration (Nasa) study such cosmic mysteries as pulsars, black holes, quasars and radio galaxies.

The Control Data Corp. ruggedized systems will control the altitude of three High Energy Astronomy Observatories to study celestial bodies that cannot be studied from earth because our atmosphere filters out their high-frequency rays, according to a spokesman.

Nondestructive Memory

The system will have an 8K-word nondestructive read-only memory with expansion capability to 16K words. The extra 8K of memory can be reprogrammed in orbit if necessary, a spokesman said. The system hinges to fit into its shock-resistant case.

The microcomputers use LSI technology; the memories will use either plated-wire or semiconductor technology, the spokesman said.

The project is being developed under a contract to TRW Systems awarded by Nasa in 1974, he added.

Diva Has Intelligent Disk Controller

EATONTOWN, N.J. – The Computroller V from Diva, Inc. is an intelligent disk controller compatible with Digital Equipment Corp. PDP-11, Interdata and Data General Corp. Nova and Eclipse minicomputers, the vendor said.

The controller responds to the code written for the CPU vendor's own disk peripheral of equivalent capacity and requires no special I/O driver, Diva said.

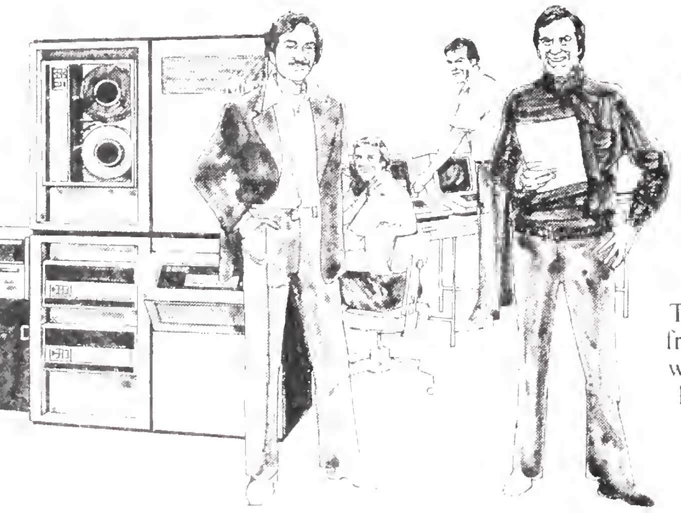
Diva will keep the system current with the vendors' software releases, a spokesman said.

A custom coupler board plugs directly into the mainframe I/O slot. The system includes Ampex or California Computer Products, Inc. 3330-type drives; its capacity can range from 25M- to 300M bytes, the firm said.

The interface can support Control Data Corp. and Memorex drives as well, the spokesman noted.

The Computroller V comes in two models. The V/DD-50 accommodates "short-stack 3330 drives" ranging in capacity from 27.3M to 82.1M bytes; it costs $13,600 to $17,500.

The V/DD-40 accommodates the full 3330-type drives that range from 100M- to 300M bytes; it costs $24,200 to $28,600, Diva said from 607 Industrial Way West, Eatontown, N.J. 07724.



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PRIME

Of All Alternatives Offered to Novices, Turnkey System May Prove Best Choice

By Jon David

Special to Computerworld

Minicomputer Exchange

Many companies installed large computer systems, yet found they frequently could not get them to do the jobs that were necessary. Since minicomputers are even more difficult to use than large computer systems, this is even more likely to happen with a minicomputer purchase.

If a company were to buy a minicomputer for, say, standard commercial applications (order entry, accounts receivable, inventory, etc.), it would be faced with the problems of getting the system programmed.

Many minicomputer vendors offer higher level languages and operating systems ,to facilitate program development by noncomputer personnel. They encourage prospective customers to buy their hardware and do their own program development to both minimize initial costs and have the programs developed by the men who understand their applications best, namely the customer and his staff.

What's wrong? Although the programming languages frequently available today are easy enough for the use of noncomputer people, there is more to programming a system than writing programs.

If one does not intelligently design a disk file structure, one may find he requires 10M characters of disk to store 1M characters of data; it may take many seconds or even minutes to retrieve individual items of information; information may get lost, improperly updated or not updated at all.

Such things are frequently not too difficult to avoid if you know what you're doing, but such knowledge is not the forte of noncomputer people.

There are many stories about companies who bought minimal computer systems, did their own initial programming, later expanded the hardware and software themselves and are overjoyed at both the performance and cost-effectiveness of their systems; such situations are the exception, however, rather than the rule.

More often than not, the end user who is not well experienced with computer equipment and techniques will develop nothing more than considerable expenses and frustrations if he tries to do his own design and programming.

An obvious alternative is looking to an outside software vendor to do your programming. Such a company does not have to lay out the money for equipment, so you need pay only for service.

If you pay him on an hourly, daily or other rate basis, you may wind up paying for nothing. If you pay him a flat fee for a predefined job, at least you will get something when you are obligated to pay for it.

Just what is it you will be getting? If you ask a vendor to give you a price for order entry, accounts receivable and inventory processing, he would like to give you as low a price as possible for two reasons: first, because you may be considering other vendors; second, because he feels you may be able to afford nothing more than a low price. He may therefore try to give you as little as possible to keep his costs and prices down.

He might not point out to you, for example, that for 10% more money you would get 50% more use; that certain conditions, although rare, might destroy or at least distort your operations or results; that internal control, never visible when it is present, may be needed; that both your programs and files should be structured differently for anticipated expansion in other areas.

In other words, he may only respond to the letter of your specifications, and you are not a computer person.

Readers are urged to reply to this or any other Minicomputer Exchange article. This is your column, a chance for you to exchange views on the various topics confronting the minicomputer user, a chance to tell the vendors what you are thinking and to let your fellow mini users know about pitfalls or new techniques in this area. Letters or manuscrips should be addressed to Minicomputer Exchange, Computerworld, 797 Washington St., Newton, Mass. 02160. Double space please.

What happens if a software vendor fails to perform? Obviously, you should not have to pay him anything. What compensates you, though, for your loss of time and your expenses in dealing with this firm?

How does it affect you if the lowest new bid you can get to do your programs is twice what the old one was?

You can frequently get a good job from a software vendor; too frequently, however, you can get severely burned.

Turnkey Alternative

A turnkey system, with one company providing both hardware and software, is another alternative.

Certain computer manufacturers, especially those marketing to the smaller commercial end user, offer turnkey systems. While this may seem the best situation, typically these manufacturers do not develop their own programs for you, but rather contract with independent vendors to program.

Although you are most frequently not obligated to pay for either hardware or software if the entire system fails to meet your specifications, you are in no better a position than if you were dealing with an independent vendor yourself.

Certain systems companies have a product line which deals with situations similar to yours. These companies are usually dedicated to a particular hardware set and are therefore familiar with its characteristics. They can program this equipment to satisfy your requirements as best possible, and as best possible is quite often really good enough.

Being familiar with your type of operation means such a firm can give you certain things you need, although you may not realize it, yet be able to give these to you at a relatively small additional cost.

A disadvantage of such a firm is it stays with a particular equipment set and often has to program around its limitations to satisfy requirements; this inefficient programming often does not become important until you later wish to expand either your applications or your data volumes.

Another disadvantage is it may try to fit inexact, previously developed programs to your particular situation.

Custom Systems Houses

Still in the turnkey area, we have custom systems houses which deal with all, or at least most, equipment vendors. Such companies have the freedom to buy whatever equipment they feel is right for your situation.

Since the minicomputer field is rapidly changing in an ongoing basis, their selection of last year might not well be their selection of this year and is very unlikely to be their selection of next year.

Such a firm will not normally have program elements from previous systems it can immediately give you for nothing, but it can be thoroughly familiar with programming your applications.

If an existing system is not an *exact* fit, however, be aware that many, many firms have discovered the "minor" changes necessary to provide the proper fit have frequently been very expensive in terms of dollars, time and operational efficiency.

As a general rule, nothing is always best, and each situation should be treated differently. A turnkey system offers much in the way of minimizing possible dollar loss and also provides a single source to contact when and if problems arise after installation.

Since, however, there is so much variation even within the turnkey area, if you have an application you wish treated by a minicomputer, you are best off contacting a qualified and independent advisory firm to help you design your application for computer treatment and to select the appropriate vendor or vendors as your situation dictates. If you cannot find such an advisory firm or cannot get appropriate references for such a firm, you should at least try to have the approach on which you have decided reviewed by a qualified independent source.

David is president of Minicomputer Industry National Interchange (Mini), a professional society treating minicomputers, microcomputers and associated technological techniques, and is also president of Systems RDI.

Get the printer capacity you paid for with a Formstacker

"With Formstackers, we can now use the *full* capacity of our high-speed printers." —Mike Menditto, check processing manager, Bankers Trust Company.

With its conversion to Burroughs 9243 high-speed printers last July, Barkers Trust check processing section completed a strategic move to faster processing of check reconcilement listings. The problem was that higher lpm speeds and skip rates were causing continuous forms to misfold and tangle, requiring as much as 15 min. per operational printer hour to clear by hand. Printer downtime was creating costly delays in processing check listings.

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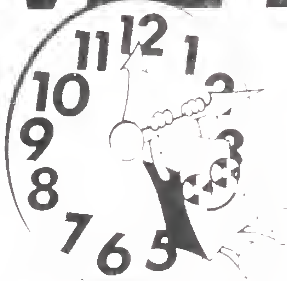

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Engineers No Longer Commuting

Small System Gives Firm Flexibility to Try and Err

NEW ORLEANS – A small business system at Grandolfi Engineering, a structural engineering firm here, provides greater flexibility for the company, according to Michael Grandolfi, president of the firm.

The company had been using both outside commercial service bureaus and the computer center of a local university before obtaining the in-house system. The use of outside services became exceedingly cumbersome, Grandolfi said.

The firm's work involves "a tremendous amount of trial-and-error types of applications" resulting in a "tremendous amount of lost motion," he explained.

After preliminary designs were developed, the engineer drove to the computer center, waited for the job to be run, drove back to the plant, checked the results and recalculated stress factors – only to hop back into the car again.

An in-house system seemed the only alternative to this, Grandolfi said. The company evaluated Hewlett-Packard and Texas Instrument systems before settling on a Wang 2200 and custom engineering software from Structural Programming, Inc. of Lexington, Mass.

Benefits Became Obvious

An example of the benefits of in-house computing was seen when the company designed the structures for 12 offshore oil compressor packages for a customer, Dresser Industries. With the system, the engineering firm prepared preliminary designs for the platforms within three weeks, half the time it would have taken if the outside services had been used, Grandolfi said.

In this instance, the flexibility was particularly necessary because Dresser might have been unable to order the steel it needed for the compressors because steel mill orders were only taken once a month.

Also, the customer's customer, Shell Oil, was losing revenues waiting for the compressors.

"That's why we could not have waited for final designs before ordering steel for the packages," Grandolfi explained. "The alternative, if we could not have prepared accurate preliminary designs in time, would have been to design the packages with larger steel members to make sure the packages could withstand the stresses they would take.

"We might well have used as much as 20% more steel in that case, and the packages we were designing weigh between 500 and 600 tons when completed."

Grandolfi reported that the preliminary designs were "fairly successful. There weren't a lot of changes necessary."

The compressor packages his firm designed for Dresser are installed on offshore oil rigs and contain the mechanical equipment which extracts low pressure gas from undersea wells and compresses that gas for transmission, he explained.

The packages house reciprocating compressors, centrifugal compressors, cooling packages and related hardware, which, depending upon the particular package's construction, must withstand various loads at each joint.

Process Starts With a Guess

The design process begins with an engineer "guessing" the sizes of the various steel members required for a package. That information, plus the number of joints, the coordinates of each joint and the load at each joint would be typed onto punch cards to be fed into the university computer.

When Grandolfi Engineering used the university DP center, it was necessary to shuffle through stacks of punch cards by hand to find the few pertinent cards each time the computer run indicated a change was necessary.

Changes were similarly made on a trial-and-error basis however, and the process had to be repeated each time the engineer guessed wrong.

That same data can now be entered through the keyboard on the Wang computer. The data is stored on a floppy disk.

Formerly, engineers were required to convert that design data into a format the university computer could accept. Grandolfi said nondegreed technicians are now able to feed information to the minicomputer, freeing his engineers for more productive jobs.

"The computer is right here," Grandolfi said. "Now we can guess the sizes of steel members, run those sizes through the computer and, if we are wrong, simply find the appropriate data on the tape, make the changes necessary and run the new design through the computer again."

Grandolfi said his original system, consisting of a 2200 processor with 8K bytes of memory and a dual cassette drive, represented a $17,000 investment.

More Uses Found

"We soon found we had more uses for the computer than we had thought," Grandolfi said, "including naval architectural applications relating to the longitudinal bend of ships' hulls and to the hydrostatic properties of ships. We spent another $8,000 to add an additional 4K of memory, a matrix read-only memory and a triple floppy disk."

The firm currently employs one programmer in order to develop software that cannot be purchased from a vendor like Structural Programming.

The floppy disks presented some problems to the firm when they replaced the tape, Grandolfi noted. Keeping the disks free of static electricity and clear of dirt produced some consternation, but the firm soon realized certain procedures had to be followed to keep the disks running well, he explained.

The company is now in the process of putting its accounting applications on-line. This has taken some time to do because the engineering applications came first in priority, Grandolfi said.

Eventually the company hopes to sell some time on the system to outside customers who need accounting functions.

The software the firm used in the compressor package design job guides the system operator by flashing a series of questions on the computer's CRT display.

The operator types in the job number, date, number of members, number of joints and the coordinates of each joint. The system then requests the geometric properties of each member in the package and the locations and sizes of the loads the package will have to bear. That load information is requested for varying conditions.

The system then calculates the optimum sizes of members necessary to bear those leads under those varying conditions; therefore, changes in sizes of members might be necessary before the design is finalized.

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Mini Helps Blooming Business End 'Paper Blizzard Problem'

APOPKA, Fla. – The minicomputer at Hickerson Flowers here has solved the firm's "paper blizzard problem" and allowed business to grow at an increased rate, according to the company's general manager.

Prior to automating, Hickerson, a wholesale dealer of Florida-grown house plants, had been using an NCR accounting machine for invoicing and monthly reports, Lillian O'Connell said.

When the company decided more in-house power was needed, the firm considered minicomputers from IBM, Burroughs, NCR and Digital Equipment Corp. (DEC). The DEC system was chosen because "we felt it was designed to do the job better than the others and came highly recommended from people who had the system," O'Connell said.

The system, a Datasystem 340 with 32K bytes of memory, was customized for the foliage industry by Parcomp, Inc., a Cocoa, Fla., OEM software house. The configuration includes 6M bytes of disk, three CRTs, a Decwriter and a 300 line/min printer; it cost the firm about $60,000.

Before the installation of the system about a year ago, the order entry process was strictly manual. Routing lists, delivery tickets, redelivery lists, shipping labels and bills of lading were hand-typed. Extra part-time help was needed to generate the documents for large orders.

Three former clerk/typists now handle the order entry system. The system routes orders to their destinations and keeps a running inventory of plants that are maturing and ready to be shipped, O'Connell said.

The error rate for shipments has been reduced, she added. Shipments are routed, addressed and priced more accurately and there is an automatic pricing structure built into the system with a special price override capability, she said.

With the system, all documents needed for filling a 3,200-case order, excluding invoices, have been generated within four hours, she noted, including time for data entry.

CI Notes

Perkin-Elmer Consolidates Three Firms Into DP Group

NORWALK, Conn. – The Perkin-Elmer Corp. has elevated its computer business activity to group status with the formation of Perkin-Elmer Data Systems.

The group represents the consolidation of Interdata, Wangco and Terminal Products.

"The new group is being established to provide Perkin-Elmer with a strong and coordinated organization to serve the rapidly growing small-system portion of the data processing field," according to Robert H. Sorenson, Perkin-Elmer president.

"With the acquisition of Wangco, Perkin-Elmer's position in the field is significantly enhanced and we now have a broader base to serve both the original equipment manufacturer and end-user segments of the market," he added.

Combined revenues for the new group for fiscal 1976, ending July 31, are expected to exceed $70 million.

Financial Woes Halt CMI

BEDFORD, Mass. – Cambridge Memories, Inc. (CMI) suspended all operations last week, idling 350 employees.

The memory maker cited "inability to reach agreement with its leading banks for immediate cash needs" as the reason for the closing.

Earlier last week, the banks had demanded payment of all outstanding loans, totaling some $16 million. This followed CMI's announcement that it expected to report "significant losses" for its third quarter ended May 29.

The company had reported a net loss of $604,000 for the first half of the year as well as a loss of $4.1 million for the year ended Aug. 31.

The employees will be recalled if financing can be arranged in the near future, CMI said.

Bunker Ramo Makes SEC Deadline

WASHINGTON, D.C. – Bunker Ramo Corp. met the deadline imposed by the Securities and Exchange Commission (SEC) for bringing its Telequote III and Market Decision System-7 terminals into compliance with SEC rules.

The requirements by the commission, which is moving toward a central electronic market system, were that the display devices be able to show the most recent sale price of a security as reported on the high-speed lines of the consolidated system and identify the market in which the trade occurred.

Procedures Seen Worsening

GSA Competitive Bidding Found Waning

By Nancy French

Of the CW Staff

WASHINGTON, D.C. – Since the Brooks Bill was passed 10 years ago to promote economy and fair competition in government procurement of DP equipment, things have gotten worse instead of better, a recent survey has found.

Last year only 36% of computer systems obtained by federal agencies with advance authorization from the General Services Administration (GSA) were competitively bid. This compared with 60% of systems obtained from 1968 to 1975.

At hearings of the House Government Operations Committee's Subcommittee on Legislation and National Security, Jack Brooks (D-Texas), chairman, blamed this state of affairs on several factors.

GSA, the agency responsible for centralized management of DP procurement, "has repeatedly authorized noncompetitive procurements which were not adequately justified." In addition, it has "failed to enforce regulations" in delegating procurement authority to the agencies and "has failed to provide the management guidance to user agencies" dictated by the Brooks Act.

While the General Accounting Office (GAO) has conducted reviews pinpointing deficiencies in policymaking, procurement, utilization, standards and enforcement of regulations, it has "failed to monitor whether corrective action has been taken," he said.

The Office of Management and Budget (OMB), charged with policymaking responsibility under the law, "has failed to establish concise, clear-cut policy" and, where policies have been issued, "has failed to provide adequate direction in their enforcement."

The National Bureau of Standards (NBS) "has failed to provide the government with necessary hardware and software standards, a situation which Brooks contended is another reason for the growing trend in noncompetitive procurements.

Finally, user agencies have consistently failed to cooperate with GSA when obtaining DP equipment. Instead, they have obtained noncompetitive, unneeded, uneconomical and poorly utilized DP resources, Brooks said.

A.G.W. Biddle, president of the Computer Industry Association, agreed with Brooks' assessment.

The GSA's practice of delegating procurement authority to requesting agencies has become so widespread it is now the rule rather than the exception, Biddle said.

Citing a recently completed DP strategy study for GSA, Biddle said 90% of all procurement requests forwarded to GSA for delegation decisions were granted.

Agencies submit to GSA equipment specifications prepared with vendor assistance that are "loaded" in favor of one particular manufacturer's product, according to Biddle.

"Without adequate technical oversight, the GSA is unable to determine whether the DP product or service being sought is available from other vendors at a lower cost," he said.

GSA should strengthen the technical competence of its DP staff and retain technical oversight, as the Brooks Bill originally intended, Biddle said.

All delayed procurement authorities (DPA) should be published to give all vendors an opportunity to comment on specifications that appear to have been loaded by "overreaching manufacturers and incumbent suppliers," he added.

Shared Guilt

But "overreaching" vendors are not the only ones at fault, he said. Federal agencies continue to violate DP procurement rules through ignorance, arrogance or because of philosophical differences with GSA, giving vendors no effective remedy.

"GAO takes six months to act and then usually finds a way to side with the agency," he said. Congress "rarely interferes with these operational matters and OMB is too understaffed, busy or too reluctant to intercede in anything other than very broad policy matters.

As an example, Biddle cited a practice by various Veterans Administration (VA) hospitals of buying IBM Model 129 keypunches this fiscal year even though the IBM contract with the Federal government prohibited the acceptance of new orders.

As a means of getting around this one-year restriction, the VA rented the devices for one day and then purchased them as "used equipment."

Multiyear Leasing Urged

Biddle also urged the subcommittee members to move forward a law permitting multiyear leasing of equipment.

"Without multiyear leasing, the manufacturer of a large CPU who is a new entrant in the field, such as Amdahl Corp., could not even bid on a request for procurement, he said.

Multiyear leasing should not be restricted to the "ADP revolving fund" but also should supply to the requesting agency's appropriations, he said.

The provision for contract cancellation without penalty on 30 days notice should be eliminated "or the multiyear leasing program will not accomplish its purpose," Biddle said.

Lessor Files Suit Against IBM Charging Leasing Monopolization

DALLAS – Reynolds Computer Corp. has charged in a federal suit that IBM is attempting to monopolize the market for leasing and selling IBM equipment "in an effort to destroy [Reynolds'] business and remove it as a competitor."

Reynolds, which leases and sells IBM equipment, is seeking $345,000 in damages.

"We consider the charges to be completely without merit and will defend ourselves vigorously against them," an IBM spokeseman stated.

Reynolds alleged IBM has been providing "markedly inferior" service on equipment purchased or leased through Reynolds although all IBM equipment is to be maintained under identical contracts.

This poor maintenance has resulted in the machines' continual malfunctioning, Reynolds claimed, adding these malfunctions have been directly attributed by IBM personnel to the fact that the equipment was obtained from Reynolds.

"Such action on the part of . . . IBM coerced and intimidated [Reynolds'] customers into leasing or purchasing all of their data processing equipment directly from IBM for fear that if they purchased or leased from Reynolds their equipment would not be properly maintained," the brief filed in the U.S. District Court for the Northern District of Texas stated.

In addition, Reynolds claimed IBM informed it that users who obtained their equipment from the leasing company would receive no free systems support.

Potential Reynolds customers were told that even if they decide to pay for such systems support, it would be provided only on an "as-available" basis, while IBM customers received it free of charge and on a priority basis, according to the suit.

Potential customers were further informed they would be denied free technical support, would no longer be invited to attend IBM seminars and would be removed or excluded from the IBM customer list "even though they leased or purchased other equipment from IBM," the brief said

IBM has until Sept. 1 to formally answer the charges.

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ITC, Ready to Make Own Tape, Has No Plans to Enter Market

By Molly Upton
Of the CW Staff

NEW YORK – Information Terminals Corp.'s (ITC) new tape production plant is making tape on an experimental basis and the firm expects to start using its production runs in about three months, Reid Anderson, ITC president, said in an interview here recently.

The firm constructed the plant in order to assure control over its media as much as for cost savings, Anderson said.

Currently the firm pays for the use of an outside product line where tape is made to its own specifications.

It will continue this practice in order to ensure backup, Anderson said. However, despite the fact the tape is made to ITC specifications, the firm has to throw away a lot of it, he added.

ITC, which makes several kinds of floppy diskettes as well as cassettes and is a licensee for the 3M cartridge, should grow about 50% during 1976, "but that's not big growth for us," he observed, since in the year ending in June revenues will have grown from $6.7 million to about $12.5 million.

The firm has no plans to enter the 1/2-in. tape market. "It looks like we can use all we make," he said.

Overall, the magnetic media markets are slowing down their rate of growth, he said, adding the cassette especially is leveling off.

There was a time when the industry could not fill all the media orders, probably because customers were double ordering attempts to ensure delivery, he said.

The 3M cartridge is "getting to be a very important product," Anderson said, adding ITC is the only licensee.

The pricing on floppies has been going down slightly, "more than we'd like to see."

IBM last winter instituted a quantity discount on its floppies and is getting competitive on large orders, he said.

ITC is shipping more of the IBM-type soft-sectored diskettes, but the hard-sectored market, while not growing, is not fading away, he said.

ITC is still privately held. For some time it has been looking at the possibility of merging or going public but is in no hurry, Anderson said, adding he would like ITC to be a little larger before making any such moves.

"The public market is better, but still not good," he said.

Ampex Executive Level Dissolves

REDWOOD CITY, Calif. – Multiple moves have taken place at Ampex Corp. with at least one attributed to a corporate refocus on the importance of video products into the field of data technology.

The resignations and changes came in what a company spokesman termed "effectively unrelated areas" and have resulted in the disappearance of an executive echelon.

Others attributed the moves to "an internal political battle between the old group and the new group."

Stanley Mantell, head of the Data Products Division, resigned and was replaced by Charles Steinberg, vice-president of the Audio-Visual Systems Division. Steinberg will head both divisions as vice-president, Audio-Visual/Data Products, as part of a corporate "consolidation."

The move, according to the Ampex spokesman, highlights corporate philosophy that video products will be more influential in data technology in the future.

Also in the Data Products Area, Al Gaudie, controller, was shifted to the corporate side and replaced by David R. Bunker.

In addition, Tom Harleman, head of marketing for the division, resigned and was succeeded by David Chapman.

On the corporate side, Sam Goodman, vice president and chief financial officer, resigned "to pursue interests of his own."

Lou Fried, head of corporate data processing, also resigned. Ben Ballard has taken over the position as manager, corporate management information systems.

Survey Finds 99% of Respondent Banks Using DP

PHILADELPHIA – A recent survey found 99% of all respondent banks were involved in DP and 88% have converted or are in the process of converting to on-premise operations.

Laventhol & Horwath, an international public accounting firm, surveyed the 617 largest U.S. commercial banks, ranked by deposits, and received nearly a 33% return.

The greatest use of outside DP services has been and will continue to be in the area of "preprogrammed packages" for such applications as consumer loans, installment credit, payroll and personal trust, the survey found.

While 36 vendors were named as applications packages suppliers, six vendors accounted for 74% of all packages purchased. They included Florida Software Services, Inc., University Computing Co. (UCC), Management Science America, Inc. (MSA), Kranzley & Co., First Wisconsin National Bank of Milwaukee and Centurex Corp.

Eighty-nine vendors were named as suppliers of contract program services, with seven firms accounting for 38% of all supplied services. The leaders were Florida Software Services, IBM, MSA, UCC, Centurex, Kranzley and Warrington Associates, Inc.

72% to Buy Applications

In the future, 72% of the banks plan to purchase application packages, 25% to continue in joint development, 15% to contract for programming and 8% to contract for facilities management.

Competition from thrift institutions and regulatory changes have had dramatic effects on the banking industry's DP research and development approaches and expenditures, the survey also found.

"Competitive pressure has resulted in all major banks using their data processing departments in their marketing efforts," the report stated.

"All the new techniques used to attract customers, such as electronic funds transfer systems (EFTS), interest-bearing checking accounts and consolidated customer statements, depend heavily on DP.

"This increased usage made it necessary for these departments to engage outside services for DP research and development to supplement in-house operations.

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This was the finding of a recent study by the U.S. Department of Commerce, published in *Export Market Digest*. And the U.S. Dept. of Commerce is an excellent source of information on marketing prospects in Japan. In summary, they report that:

1. Japan will continue to increase imports of foreign-manufactured EDP equipment at the rate of 30% per year through 1977. In 1977, total Japanese DP imports will exceed $1 billion per year.
2. The U.S. share of the Japanese import market is 55%. This should remain constant, although in previous years the U.S. share has reached as high as 70%.
3. Minicomputer sales in Japan are expected to chart a phenomenal 60% annual growth rate through 1977.
4. Independent peripheral equipment purchases are expected to rise 44% in this period.

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As Difficult as Small Demand

Large-Demand Mart a Challenge to DG

NEW YORK – "Marketing in a marketplace of excessive demand is as challenging a management task as marketing in a marketplace of too little demand, although the disciplines of the two situations are quite different," according to Herbert J. Richman, marketing vice-president at Data General Corp. (DG).

Recently the firm has experienced both, he said here recently.

Both orders and shipments are running very strong.

"We saw orders stretch out our lead times earlier this year" and the factory is now in the process of catching up.

"Lead times for many products are more reasonable for our customers today than several months ago, although there is more yet to be done to reduce them," he observed.

"Eclipses can now be shipped in 60 days, Nova 2s in 90 days, and Nova 3s in 90 to 120 days. That should tell one something of the very strong incoming order rates for those OEM computers," Richman added.

The Micronovas will be shipped starting this fall.

"It's too early to assess Micronova acceptance, and it is not likely to become a major share of volume in 1977, but we like the direction it takes us in the market," he commented.

Lead Times

"We have found no evidence of losing business because of excessive lead times, however, since most of our competitors have experienced the same kind of stretch out in lead times.

"End users of these computers usually expect shorter lead times than many OEM customers. Thus, we have worked to reduce the Eclipse cycle," Richman said.

"However, Nova 3 lead times are still longer than we would like for our OEMs, and we hope to reduce them in the next few months," he said.

"The balance of orders and shipments is one of the things to manage carefully in times of strong demand," he added.

"We also try to choose business during these times that matches our own resources. For example, if Nova 3 lead times are uncomfortably long for some customers, we direct greater selling attention to shorter cycle products, such as Eclipses and Nova 2s.

"Most of our salesmen are trained in the entire product line and have been successful in switching product selling emphasis rather quickly. The commission structure naturally helps them shift gears," Richman said.

More Selective Selling

"We also try to be more selective in the kinds of business we go after. The difficult or complex or pioneering kind of customer or application may not be the one we can tackle in these times.

"We have worked hard to find profitable business in the past, since it is one of the basic criteria for us being in business.

"In today's marketplace we believe we are being even more successful at this search," Richman said.

"One result of this kind of market is the increased productivity of our sales people. We are unable to bring new trained salesmen on stream at the rate of incoming orders.

"And the commission system of motivating our field people tends to accelerate order rates in this kind of market," he said.

"This situation also suggests a lot about our pricing and concession tactics, which have never been known for being liberal.

"It is frankly beyond me how one can reduce prices in a market of excessive demand unless he has a problem he probably should have fixed another way," he said.

"Finally, the current demand situation makes us assess regularly our plans for product introductions," Richman said.

This situation leads one to several conclusions about the current marketplace:

- There may be more demand than anyone has resources to meet.
- Competitive actions, such as pricing, new products, new applications, are likely to have little impact on the forward movement of anybody, unless a very specific segment is targeted.

DG has been doing more thinking about its longer term planning as a company. It has been restructuring its marketing organization for some time so the market planning process can mature and become more orderly, he said.

Vice-president of North American sales, Dick Weber "essentially relieves me of the day-to-day job of managing the sales function so I can devote more attention to overall management," Richman said.

U.S. Firms to Show Products in Kuwait

ATHENS, Ohio – A multi-industry exhibit for U.S. firms is scheduled to take place in Kuwait Nov. 20-26.

The fair, American Expo-Kuwait 76, will be held in the Kuwait Hilton and Massila Beach Hotel and will include communications equipment and computers.

"As the Arabs industrialize and their systems become more complex, demand for computers will increase," according to Azmi D. Mikhail, president of Overseas Financial and Investment Services, Inc. "Governments will remain good sales targets since they are among the more complex institutions."

Further information on the exposition is available from Mikhail at P.O. Box 36, Athens, Ohio 45701.

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Simpler Products Seen Needed in Remote Computing

By D. Curtis DeForest

Special to Computerworld

WOODBURY, N.Y. Recent Calldata surveys of present and potential users of remote computing services all seem to point in one direction: Markets for remote computing can be substantially broadened if customers can be provided with simpler products/services and personalized service.

Potentially, every business with $500,000 or more in annual sales can profit from some kind of remote computing if the service bureaus can come up with improved personalized service and simpler products.

The customer's desire to see better personalized service, incidentally, is somewhat puzzling to me: The very concept of a service bureau implies personalized service. The only explanation that can be offered here is that perhaps we, as an industry, have been guilty of not being fully responsive to the variety of customer requests. One way to improve this situation is through applications support. More will be said about it later.

Our best-selling products are those where a customer does not have to learn something drastically new by switching to remote computing.

The potential mass user of remote computing is a small business whose managers have neither time nor desire to learn some complicated programming scheme that eventually might prove helpful.

Product simplicity implies overall service simplicity: programming, presentation of results (printout), pricing of service, communication with computer, etc.

Product Simplicity

In developing any new market, product simplicity and ready usefulness are the key.

Continuing the tradition today of forcing the customer to learn computer jargon simply won't do if the huge potential markets for remote computing are to be tapped.

Fortunately, hardware and software technology today is at the point where English-language programming can easily be the rule rather than an exception.

It is technologically feasible for service bureaus to offer simpler products.

Application programs can be written with front ends in the jargon of each discipline (application) rather than in some "universal" pigeon English.

Litigation System

Can this be done economically? Calldata has several applications programs like this in its library, one of which is an automated litigation management system called Leximatic.

It was developed by recognizing that a defending lawyer in a typical litigation suit frequently has to retrieve the required information quickly and completely.

The major constraint during the development of the system was to make it readily usable by a lawyer or his staff without any computer training.

The logic of the system and the physical handling of the documents are those of the index-book approach familiar to most lawyers.

Through a terminal, the lawyer has access to all documents not only by any single descriptor, but by any combination of descriptors.

This system is an example of an attempt to meet the need of a customer without the complexity and inconvenience of learning some "simple" computer jargon.

It took some effort to develop, and internally it is a rather sophisticated program. But externally, and this is where the program interfaces with the user, it is simplicity itself.

Our experience with this and other truly simple products indicates a very high degree of customer acceptance and satisfaction.

Consequently we feel that opening up of new "nonsophisticated" markets must be done with products that are at least as simple.

Price Value, Not Cost

Product simplicity will not only help open up new markets, but it may automatically solve (simplify) our present problem of pricing a remote-computing service.

It should be remembered that, in the final analysis, a typical user is really interested in something like "How much will it cost me to prepare X number of paychecks (purchase orders, tags, labels, monthly statements, etc.) i.e., how much will it cost me to prepare each check?"

Before the advent of simple systems, a typical service bureau was forced to charge on the basis of artificial units like "system hour," "resource unit" and other equally puzzling (to the user) terms.

This process can and should be simplified for the user.

Getting Personal

To provide users with a truly personalized service, it appears good results can be obtained through the use of a marketing organization comprised of four branches: sales, technical support, customer service and applications support.

The sales branch has an obvious function: selling the service to prospective users.

The technical support branch should be responsible for all technical problems that might come up. A person should be available on a short notice both for visits and for telephone consultation.

The customer service branch should be responsible for all nontechnical problems such as interfacing the customer and the bureau's operations staff and aiding the customer with installation of various equipment.

The fourth branch – applications support – is practically nonexistent in most bureaus today.

It should 'be responsible for assisting customers with their applications. People staffing this branch should be specialists in businesses served by the bureau.

The overall simplicity of remote-computing service implies the ability to satisfy one's computing needs by dealing with a single service bureau.

Indeed, by dealing with just one vendor, the user gets the benefit of a single invoice, one set of rules and procedures, simpler liaison.

At the same time, it is a truism that different applications, for best cost/performance, should be done on different machines and/or in different computational modes.

Of course, there is more to the overall computing service than just product simplicity and personalized service like security (software and physical).

Other factors include: response time, reliability and backup, availability of on-line and off-line storage, systems time availability, availability of immediate telephone assistance and others.

But product simplicity, with all its implications, will be crucial in broadening the mass markets in the late '70s and '80s.

DeForest is vice-president of Calldata Systems, Inc.

Executive Corner

ARMONK, N.Y. Bart M. Stevens, formerly president of IBM's Office Products Division, has been elected an IBM senior vice-president and appointed a member of the firm's Corporate Management Committee.

Stevens, who will also head the corporate operations staffs, succeeds Warren C. Hume, who has retired after nearly 37 years.

James J. Foreses, formerly assistant group executive of IBM's General Business Group, succeeds Stevens as president of the Office Products Division.

■ Dr. A.D. Berk has been appointed vice-president of engineering and O. Lynn Gilmore has been named vice-president and general manager, Micromega, for Bunker Ramo Corp.'s Electronic Systems Division.

■ Three people have been named vice-presidents at National Sharedata Corp. Mark Smylie, John French and James M. Paolozzi have taken charge of management services for the corporation's Memberbank Marketing Group, the new Systems Marketing Group and the firm's Los Angeles data center, respectively.

■ Peter C. Waal has been named vice-president of systems development of Telenet Communications Corp.

■ Tom F. Jahn has been named president of Facit-Addo, Inc., with responsibility for the firm's U.S. operations.

■ Richard N. Spann has been named vice-president of development of Adage, Inc.

■ Rex R. Hollis has been named vice-president of marketing of Southern Pacific Communications Co.

■ Robert E. Sundius has been elected corporate vice-president and David J. Barber has been elected vice-president of software development of Mohawk Data Sciences Corp.

■ William T. Burgin and Michel R. Bailleul have been elected to the board of directors of Compuscan, Inc.

■ William E. Huber has been appointed vice-president of marketing of Genisco Computers, a division of Genisco Technology Corp.

■ Carroll A. Pedigo has been appointed vice-president of Scientific Software Corp.

■ William I. Bauer has been elected vice-president and director of health programs and William J. Veigele has been elected vice-president and director of the Resource Sciences Institute of Kappa Systems, Inc.

● Anna Tipton has been elected corporate vice-president of Advanced Computer Techniques Corp.

POSITION ANNOUNCEMENTS

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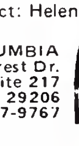

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These positions offer exceptional opportunities for individuals who are innovative and ready to assume significant roles with a company in the forefront of medical research.

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DESIRABLE: TSO/WYLBUR and prior supervisory experience.

PROGRAMMER/ANALYST

REQUIRED: Degree or equivalent, with experience in PL/1, FORTRAN and OS/JCL (for use in scientific/statistical and data base/IMS applications).

DESIRABLE: COBOL and on-line applications experience.

If you are ready for an important step in your career and want to be associated with goals worth your involvement, send a resume to Manager of Scientific Employment, Schering Research Center, 60 Orange St., Bloomfield, N.J. 07003.

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a Division of the Multiple
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PROGRAMMERS ANALYSTS

[illegible] possess a minimum of 2 years technical experience on mini-computers, [illegible] scale integrated systems, and the ability to write effective programs in [illegible] or Fortran. Also a working knowledge of operating system [illegible] utilities would be a definite asset. In addition to the requirement [illegible] computer specialists, there exists selective openings for [illegible] with comparable skills on large scale IBM equipment. [illegible] offers an excellent opportunity for career advance[illegible] above average remuneration. Please submit resume in strictest confidence to:

Director of Personnel
COMSERVE
[illegible] Don Mills Road, Don Mills, Ontario
Canada M3C 1W2
Telephone (416) 443-6860

PROGRAMMER/ANALYST
COBOL or BAL

The CHICAGO BOARD OPTIONS EXCHANGE, the nation's central marketplace for buying and selling stock options, is seeking a versatile individual for Programmer/Analyst assignments.

Our operating environment: 370/145 OS/VS-1. Your assignments will utilize your creativity in various support projects. (e.g. compliance, membership, floor operations, research, etc.)

We seek at least 2 years OS/JCL business applications programming experience and the ability to interface with user dept's and managers at all levels.

If you're seeking a contemporary, dynamic, growing and secure environment in which to further develop your abilities, LET'S GET TOGETHER.

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PROGRAMMER ANALYSTS

Blue Cross/Blue Shield, a major Chicago base health insurance organization, has need for several experienced programmer analysts. Continued expansion and increased demand in the systems area has created these professional growth positions.

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* LEAD PROGRAMMER ANALYST
* SR. PROGRAMMER ANALYST
* SYSTEMS STAFF ANALYST

To qualify, you must have at least 2 years systems experience with proficiency in ANS COBOL OS VS JCL, and the ability to communicate effectively with all levels of management. Any BAL, Data Base, or insurance experience would be an added plus. College degree preferred.

We offer an excellent competitive salary, exceptional benefits including 11 paid holidays, tuition assistance, dental insurance, hospitalization, subsidized cafeteria and a non-contributory retirement plan and more.

Learn more about these professional growth opportunities by calling John Sheehan, from 9 30 AM to 4:30 PM at (312) 661-8165. If unable to call, please send resume with salary history to:

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233 North Michigan Avenue
Chicago, Illinois 60604
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Career opportunities available in an Atlanta Commercial Bank's expanding Systems and Programming Department. Self-motivated professionals needed in the exciting world of on-line transaction processing systems and banking applications in a multi-processing and multi-programming environment.

Programmers: Minimum two years experience in COBOL, preferably on a large to medium scale system with banking application experience.

Analysts: Two years experience in systems design with a COBOL programming background. Banking applications experience necessary.

Programmer: Six months to one year experience on a mini-computer preferably a Varian. This position ideal for a programmer desiring to move into a COBOL assignment.

We offer an excellent benefit package and a salary commensurate with experience. Send resume with current salary to P.O. Box 23, Atlanta, GA 30301. *An equal opportunity employer M/F.*

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Computer Programmer/Analyst

Immediate Opening — At least three years of computer programming using cobol, preferably in an educational environment. Responsible for preparing all elements for coding and documentation; defining test data and requirements; developing operating instructions and users manual; and other related duties. Salary is negotiable. Please send letter of application and resume to: Director of Personnel, Saginaw Valley State College, 2250 Pierce Road, University Center, MI 48710

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For further information on these and other positions, send resume in strict confidence to:

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PROGRAMMER

North San Francisco Bay Area (California) manufacturer is in need of a programmer with 2-3 years mini-computer programming experience and extensive knowledge of BASIC language. Degree preferred but not required. Salary 14-18K dependent upon experience. Send resume and salary history in confidence to:

CW Box 4718
797 Washington St.
Newton, Mass. 02160
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COMMUNICATIONS SOFTWARE ANALYST

Maryland-based Headquarters of management services organization seeks Communications Software Analyst to conduct research, planning, evaluation, development and maintenance of current and future H/6000 front-end and teleprocessing software. Applicant must have extensive background and expertise in GRTS and/or HPS, TPE and/or TDS very desirable. Should have degree and minimum of 3 years direct experience in the H/6000 communications environment or similar large scale systems. Offer includes competitive salary, liberal benefits, paid relocation and an excellent career opportunity. All qualified applicants are invited to forward a confidential resume to:

James M. Pursley
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Our firm, the newest professional search in the San Francisco Bay Area, is constituted by individuals with extensive background in data processing consulting and recruitment. We have numerous requirements for computer professionals considering new opportunities, such as:

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Several positions throughout the Bay Area typically requiring IBM 370/OS/VS or DOS internals; MVS; IMS; CICS, etc.

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Should have several years experience in analysis, programming and/or EDP auditing. Excellent communication skills required.

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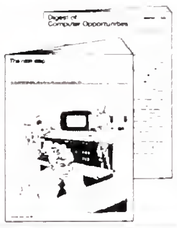

"The Next Step", Source Edp's tenth annual salary survey and career planning guide, is now available. You'll also receive without charge our latest "Digest of Computer Opportunities" describing specific career openings currently available within our client organizations nationwide.

For your free copies of our publications "The Next Step" and "Digest of Computer Opportunities" write:
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100 South Wacker Drive
Chicago, Illinois 60606
(P.S. Be sure to use home address
and indicate position title.)
Or call your nearest Source Edp Office:

East: Boston (617/237-3120), New York-New Jersey (201/687-8700), Philadelphia (215/665-1717), Washington, D.C. (703/790-5610).

Midwest: Chicago (312) 782-0857), Cleveland (216/771-2070), Detroit (313/352-6520), Kansas City (816/474-3393), Minneapolis (612/544-3600), St. Louis (314/862-3800).

South & Southwest: Atlanta (404/634-5127), Dallas (214/638-4080), Fort Worth (817/338-9300), Houston (713/626-8705), New Orleans (504/523-2576).

West Coast: Los Angeles (213/386-5500), Irvine, CA. (714/833-1730), Palo Alto (415/328-7155), San Francisco (415/434-2410).

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COMPUTER MAINTENANCE ENGINEER

Large-Scale Environment Opportunity That Offers A Professional Challenging Potential

Career opportunity for an experienced Computer Maintenance Engineer to coordinate and oversee computer and data transmission maintenance service organization work. Will define installation facility requirements and coordinate installation of new equipment. Current computer systems including IBM, 360/75 with IBM Ampex, Memorex and Telex peripherals and Control Data CYBER 70/Model 76 and CYBER 170/Model 173. Degree in Electrical Engineering with 5 years' experience in the maintenance of control data large scale computer systems with data transmission equipment required.

If interested and qualified send resume including salary requirements, in confidence, to:

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Aerojet Nuclear Company

550 Second St., Idaho Falls, Idaho 83401

U.S. Citizenship Required.

Aerojet Nuclear Company is an equal opportunity employer and we welcome responses from minorities, females and handicapped.

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PERIPHERAL SYSTEMS PLANNING

FORMATION, INC., a growing company in the computer field, needs an experienced professional to plan its computer peripheral products. Responsibilities would entail negotiation with potential customer marketing and engineering personnel to define product requirements. Market surveys, business plans and product specifications for peripheral devices/subsystems would be generated. The qualified individual should have had several years experience in the area of peripheral equipment including tape and disc drives and memories and experience in dealing with computer systems customers, preferably in a marketing role. a BSEE is required and MBA desirable. Salary is commensurate with experience plus excellent benefits. Please send resume in complete confidence to: Personnel Director.

formation

823 East Gate Drive
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SR. SYSTEMS ANALYST

Progressive Medium size manufacturer has an opening requiring substantial knowledge of manufacturing systems including material requirements planning. Any Data Base experience, especially TOTAL would be a plus. Must have capability of managing the department. Start $18-22,000 + excellent fringes. Fee Paid. Contact Mike Clarke.

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Southern California metals and electronics distributor, in existence since 1849, seeks a qualified OS Environ/1 systems programmer Experience level of 4-7 years, minimum of 2-3 years E/1, T.P. internals. TOTAL a plus. Salary range 17-20K. We provide a complete company-paid benefit program, relocation and professional growth, and promotional opportunities. Send resume to Manager of Data Processing, P.O. Box 70104,Los Angeles, Calif. 90070.

Word Processing

California

Client seeking project leader with software experience in computerized word processing utilizing shared logic and centralized mass storage. This growing, financially stable company offers an extremely attractive package plus fully paid relocation. Send resume and salary history to.

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Our needs are immediate. We would appreciate only responses from professionals who are genuinely interested in a career change.

Reply in strict confidence:

V.P. Data Processing
CW Box 4721
797 Washington St.
Newton, Mass. 02160

Programmer Analyst

The Center For Naval Analyses Wants To Hire A

FINANCIAL SYSTEMS PROGRAMMER/ ANALYST

Requires Bachelor's Degree in Accounting or Business Administration plus 1-3 years of programming experience in administrative or financial systems. FORTRAN experience is essential and some experience with COBOL desirable.

Duties include: Systems design, programming, installation and maintenance of management information systems, primarily financial.

This is an outstanding opportunity for the qualified individual to have responsibility for the design and programming of a financial information system.

Send resume's to:

THE CENTER FOR NAVAL ANALYSES

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COMPUTER PROFESSIONALS

SEI is a growing data processing service and consulting firm providing system analysis, evaluation, and development services to an expanding group of midwest and national organizations, both in industry and government. SEI works primarily with OS/VS systems, but with attention also to other systems and manufacturers.

SEI has openings for dedicated professionals who work hard, who seek challenges and who welcome diversity. The openings are primarily for work in the metropolitan Chicago area, but a willingness to travel is an asset.

PROJECT MANAGER

With general responsibility for one or more consulting projects for a client, the Project Manager identifies system and data processing problems, defines their solutions, and supervises their implementation. The Project Manager assigns and supports technical personnel, and works directly with client personnel providing training and guidance services, and serving as a primary communication link between client and project personnel. The Project Manager is expected to identify problem areas and client needs.

Applicants should have a bachelor's degree (or equivalent) and 10 years of significant professional experience, including programming, system analysis, and project management. Applicants must have demonstrated supervisory skills, the ability to deal effectively and constructively with clients and technical personnel, and the ability to handle concurrent, competing tasks and to allocate scarce project resources. Salary: $23,000 - $33,000.

STAFF MANAGER

A Staff Manager directs a team of 8 - 12 consultants and programmers, and guides their ongoing professional development. Team members are assigned, individually and in groups, to a variety of technical projects. The Staff Manager provides continuity, direction, training, and guidance, through one-to-one support, and by conducting formal and informal workshops on programming languages and skills. The Staff Manager assists in recruiting technical personnel, and in the development of technical standards and practices.

Applicants should have a bachelor's degree (or equivalent) and 10 years of data processing experience over a wide range of applications, including analysis, programming, project management, and operations. Programming experience should include at least three widely used programming languages. Three years of teaching or management experience is necessary. Training or experience in personnel management is helpful. Salary: $27,000 - $37,000.

SOFTWARE SPECIALIST

The Software Specialist is a top-notch programmer and analyst who can take vague descriptions of program products desired, and carry them through all phases of design and development, including documentation. The Software Specialist works on the design and implementation of proprietary software, client projects, and complex application problems. The Software Specialist provides technical support and user guidance, and assists in training new personnel.

Applicants should have a bachelor's degree (or equivalent) and 10 years of technical experience with involvement in Assembly Language, two high-level programming languages, two large-scale computer operating systems, and two application areas. Three yeras of experience must relate to system internals and low-level hardware usage. Excellent analytic and programming skills are expected, plus thorough knowledge of computer operating systems and applications. Salary $23,000-$33,000.

Salaries are flexible depending on the applicant's abilities and experience. An excellent benefit package is provided. Send detailed resume and salary requirements to:

SEI
computer services

450 East Ohio Street
Chicago, Illinois 60611
Attn.: Jane Hesse

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Programmers

The University of New Mexico Computing Center in Albuquerque has openings for the following positions.

Applications Programmer

Knowledge of IBM, OS, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/2 or assembler) required. Successful applicant must have at least one year experience as a programmer. Bachelor's degree or equivalent in experience. Starting salary range $8,674 - $11,253.

Sr. Applications Programmer

Knowledge of IBM, OS.MVT, JCL and at least 2 high level languages (FORTRAN, COBOL, PL/1 or assembler) required. Must have at least 2 years experience as a programmer. Bachelor's degree or equivalent in experience. Experience as a lead programmer desirable. Starting salary range $9,568 - $12,251.

Sr. Systems Programmer

Generate, maintain, modify, document and consult (All on OS/HASP) Assembler language and 2 high level languages required. Bachelor's degree or equivalent in experience plus 3 years systems programming experience. Knowledge of 360 architecture. Starting salary range $14,123 $17,784.

The University of New Mexico is located in the heart of the "Land of Enchantment". Although it is among the least densely populated states, New Mexico boasts a richly textured heritage in 3 major cultures - Indian, Hispanic, and Anglo. These traditions still flourish and are explored through the gamut of artistic endeavors from the Santa Fe Opera to the numerous galleries and craft shops in Santa Fe and Taos. The enchantment of the arts is second only to the land that inspires and informs them. New Mexico's excellent climate graces the raw beauty of the moonlit desert and the alpine meadows in the mountains. And in winter, the numerous ski slopes make New Mexico a land of year round enjoyment.

Send resume and salary requirements to: Director of Computing Center, University of New Mexico, Albuquerque, New Mexico 87131

an equal opportunity employer m/f

SYSTEMS PROFESSIONALS

CNA, an imaginative and innovative insurance organization is installing a $26 million IBM 370 computer system that will be the most modern in the insurance industry and seeks several key systems professionals. We prefer individuals who are dedicated to career advancement and desire to be involved in the development of state of the art systems and applications. We operate in a MVS 158MP/168MP, IMS, TSO, RJE environment and seek:

SYSTEMS CONSULTANTS AND ANALYSTS

At least 3-5 years of systems experience in an Insurance or Financial Services business.

In these positions we prefer you have experience in Management Information Systems or Insurance Processing Systems for Casualty, Personal or Commercial Lines. You should also be able to communicate effectively with all levels of management and systems personnel.

SENIOR PROGRAMMER/ANALYSTS

Experience in implementation of an on-line Life Insurance Processing Systems. The ideal applicant will possess in-depth Life Insurance experience, with emphasis on Policy Holder Service or Actuarial and a strong technical background which includes proficiency in BAL, COBOL and OS-JCL.

DATA BASE/DATA COMMUNICATIONS ANALYST

Practical experience with IBM equipment, data base processing capabilities and IMS access methods. You'll provide technical support to application development and operations areas in their use of IMS. The ability to provide design support in the data base and/or data communication areas of IMS is essential.

We offer an excellent salary plus generous benefits and relocation assistance for these positions in our modern and convenient Chicago loop headquarters. For immediate consideration, please send your resume with salary history to Employment Manager.

INSURANCE FROM

CNA

CNA PLAZA
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Systems Programmers

Allegheny Airlines has immediate openings for systems programmers with experience covering a broad area and levels in system design. Minimum requirement BS degree and 1 year experience on IBM hardware supporting SVS/HASP/TSO systems.

Computer Operators

Immediate openings for computer operators with a minimum of 1 year experience on IBM Systems/370, OS/VS-VM/HASP or PARS. Must be willing to work shifts.

We offer excellent salary commensurate with skills, ability, and experience, company-paid benefits, and free or reduced rate travelling privileges for you and your immediate family members. Our data processing center is located in suburban Arlington, Virginia. If interested and qualify for either of the above positions, please mail resume and salary history in confidence to Employment Services, Allegheny Airlines, Washington National Airport, Washington, D.C. 20001. Equal Opportunity Employer M/F.

ALLEGHENY

Engineering

Customer Engineer

(IN-HOUSE POSITION)

Hardware specialist needed to maintain a large mini computer system. Experience in trouble shooting from system to chip level a must. Degree optional. Salary commensurate with ability. Comprehensive benefits. Call Ms. O'Keeffe (212) 868-6433.

Equal Opportunity Employer M/F

Director of Data Processing

A small liberal arts college in Upstate New York is seeking a Director of Data Processing who will be responsible for the development and coordination of the data processing function for both the academic and the administrative uses of the computer.

A Bachelor of Arts degree required (MBA a plus) with three to five years experience in data processing, preferably in a college environment. Programming knowledge in RPG and Fortran is required, General Automation experience desirable. Applicant must possess good communication skills both verbally and in writing. Salary level is $15-18,000 with excellent benefit program. **Send resume to: CW Box 4725, 797 Washington St., Newton, Mass. 02160.**

PROGRAMMER/ANALYST

Philadelphia Institution located in Center City is seeking an experienced Teleprocessing Programmer/Analyst. Candidate should have a minimum 2 years CICS experience working with large scale IBM equipment. OS a must, PL/I helpful. Good benefits. Send resume in confidence or call:

Mr. Wiegel
(215) 972-7061

Community College
of Philadelphia
Computer Center
34 S. 11th Street
Phila., Penn. 19107
Equal Opportunity Employer

Intercomm Systems Programmer

U.S. Energy Research and Development Administration in Albuquerque New Mexico is seeking a Systems Software Programmer with a minimum of 2 years' experience in OS/MVT and minimum of 1 years' experience as INTERCOMM Systems Programmer. Work involves maintaining INTERCOMM system tables and writing and maintaining local modifications to INTERCOMM. Experience with COBOL programming desired. ASSEMBLER programming is necessity. Salary $16,255 to $20,678. Please send resume to Stephen G. Buswell at: **U.S. Energy Research and Development Administration, P.O. Box 5400, Albuquerque, N.M. 87115.** *An equal opportunity employer.*

OPPORTUNITY IN HEALTH CARE SYSTEMS

Are you a Systems Analyst or Programmer/Analyst looking for high visibility and substantially increased responsibility in a rapidly expanding data processing installation?

We are a large teaching hospital located in the suburbs of a major Mid-Western city. Hospital administration is making a significant new commitment to developing computerized systems in all areas of health care. Our ability to meet that commitment depends on the recruiting of top flight data processing professionals.

If you are interested in joining a quality staff, on the forefront of computer technology and applications design, in the industry exhibiting the fastest data processing growth rate, we want to hear from you. Our is a fast-paced environment affording an excellent opportunity to learn while you make a real contribution. Salaries are more than competitive for the right individuals.

Keys to this unique opportunity are 2-5 years data processing experience, demonstrable systems development successes, good communications skills, and project leader potential. Health care systems experience and a college degree are highly desirable.

Responde in confidence to:

CW Box 4726
797 Washington Street
Newton, Mass. 02160

COMPUTER AIDED DESIGN

Technical Leadership

If you have a broad computer aided design background in an electronic development/manufacturing environment and have a strong desire to provide technical leadership as a career goal we would be interested in talking with you.

We are planning to implement an integrated system which will provide a fully automated process to aid the design and manufacturing areas with computer aided support facilities. Major duties will be defining the system architecture and implementation.

The individual we seek should have an EE or CS preferably at the advanced degree level, with several years of solid background in computer aided design, large software systems, data base design. and high-level language concepts. This technical-professional position offers a rare opportunity for the individual who has a proven record of accomplishment in a leadership role of computer aided design.

We offer an excellent starting salary along with a full fringe benefit package. Confidential resume outlining experience, education, responsibilities, and salary requirements should be submitted to:

David G. Crowley
Professional Employment

GTE AUTOMATIC ELECTRIC LABORATORIES

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Ideally you should have a COBOL background and/or assembler experience, preferably in a manufacturing and/or financial environment. Requires a minimum of one year experience and demonstrated ability in programming and/or systems design.

Send your resume, including salary history and location preference in strictest confidence to: Mr. William Smith, Corporate Management Systems Development, B-3, Rockwell International, 2135 West Maple Road, Troy, Michigan 48084.

Rockwell International

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COMPUTER ENGINEERS

Software and Systems

NCR's Point-of-Sale Division in East Central Ohio has grown considerably in just three-and-a-half years. Our Engineering facility alone has increased from 100 to nearly 400 employees. This growth suggests a high degree of satisfaction with the kind and level of work being performed. Moreover, the fact that just about all of them are still with us also indicates they are pleased with the living environment this open, rural area offers them and their families.

The Point-of-Sale Terminal Systems is an expanding market for the computer industry and, accordingly, highly competitive. To maintain our lead position in the field, we require the talents of experienced Systems Engineers and Software Engineers with mini and microprocessor exposure. We invite you to send your credentials, including your area of work interest, for consideration.

Software Systems

Software Systems Engineers will define and develop overall total systems level software architecture required for future terminal control systems. This will include operating system software, system level simulations, system level diagnostics, and communications including in-house digital links and common carrier networks.

Software Design

All terminal software development in the new generation of P.O.S. terminals is performed by the software design groups. They also develop the support software for these new terminals. Working in a small team atmosphere you will become an immediate contributor to the software product.

Knowledge and or experience in Assembly Language programming, mini microcomputers, and exposure to at least one of these areas — operating, I/O, communications or system test software design—are essential. In addition, experience with Procedural Language programming, software system integration and testing will be helpful.

Systems Engineers

They will define the requirements of real-time micro minicomputer systems — both the hardware and software. This entails the conceptual design, performance analysis, design support and critical design tradeoffs.

The more senior computer professional will bring from 2-10 years experience in the systems or software areas; the entry level candidates will bring sound knowledge of the areas indicated in support of their inquiries.

We invite you to contact us at your earliest convenience for placement consideration.

Robert W. Donovan
Terminal Systems Division
NCR Corporation
P. O. Box 728
Cambridge, Ohio 43725
Phone: 614/439-0398

NCR

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SYSTEMS PROGRAMMING
LIBRARY SYSTEMS SPECIALIST

The Pennsylvania State University is seeking a person to assume primary analysis responsibility in the position of Library Systems Specialist, available immediately. Responsible to the Director of Systems Development. Responsibilities include research, planning, implementation, and testing; coordination and management of the analysis staff; comprehensive project documentation.

Minimum qualifications: Bachelors or masters degree or equivalent in appropriate field, four to five years project related experience with medium and large scale time-share computer systems and/or significant experience in large university or special libraries.

Send application together with vita to Paul M. [illegible], Personnel Librarian, 505 East Pattee Library, The Pennsylvania State University, University Park, PA 16802. Application deadline: August 15, 1976.

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SYSTEMS DEVELOPMENT
SYSTEMS MAINTENANCE

We have a number of new and challenging opportunities involved with the development and maintenance of application and operating systems. Our company is a fast-moving carpet manufacturing, distribution and retail operation currently grossing 85 million in annual sales. Our plans for the future include heavy emphasis on development of on-line real-time financial, manufacturing and distribution systems. We presently have openings in our Management Information Systems (MIS) Department for the following individuals:

COMPUTER SYSTEMS DESIGNER
(SYSTEMS ANALYST)

Applicants should have a bachelor's degree in mathematics, computer science or one of the scientific or systems disciplines, plus a minimum of 3 - 5 years experience designing and programming business computer application systems. Competence in Cobol, IBM System/370, DOS-VS, CICS-VS and Power-VS is required.

COMPUTER SYSTEMS DESIGNER/PROGRAMMER
(PROGRAMMER/ANALYST)

Applicants should have a bachelor's degree in mathematics, computer science or one of the scientific disciplines, plus a minimum of 2 - 3 years experience programming business computer application systems. Competence in Cobol, IBM System/370 and DOS-VS is required.

OPERATING SYSTEMS TECHNICIAN
(SYSTEMS PROGRAMMER)

Applicants should have a bachelor's degree in mathematics, statistics, computer science or one of the related scientific disciplines, plus a minimum of 3 years experience designing and maintaining operating software for an IBM System/370 with DOS-VS, CICS-VS and Power-VS. Competence in Cobol and on-line real-time systems, both local and distributed, would be a plus.

All positions above require individuals of unusual academic and personal quality. Our MIS staff is comprised of bright, aggressive systems professionals whose dedication to their tasks is reflected in major information efforts throughout all operating units of our company. Please send your resume in strict confidence to:

Mr. John A. Wixson
Director of Management Information Systems

Salem Carpet Mills, Inc.

P.O. Box 12429
Winston-Salem, North Carolina 27107
(919) 727-1200

An Equal Opportunity Employer M/F

Software Support Managers

If you've been solving computer system software problems for at least five years and can point to at least three to five years of solid line management experience in a pre-sale and post-installation customer software support capacity, we can offer you a chance to move out. And up.

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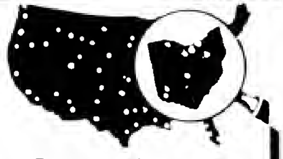

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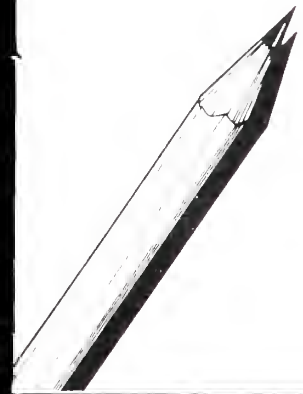

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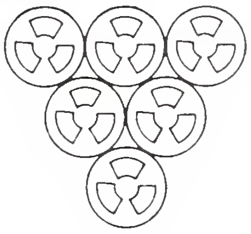

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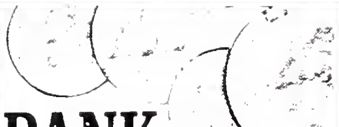

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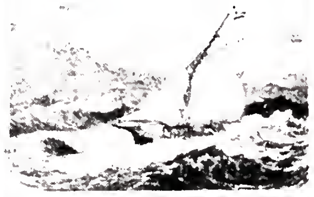

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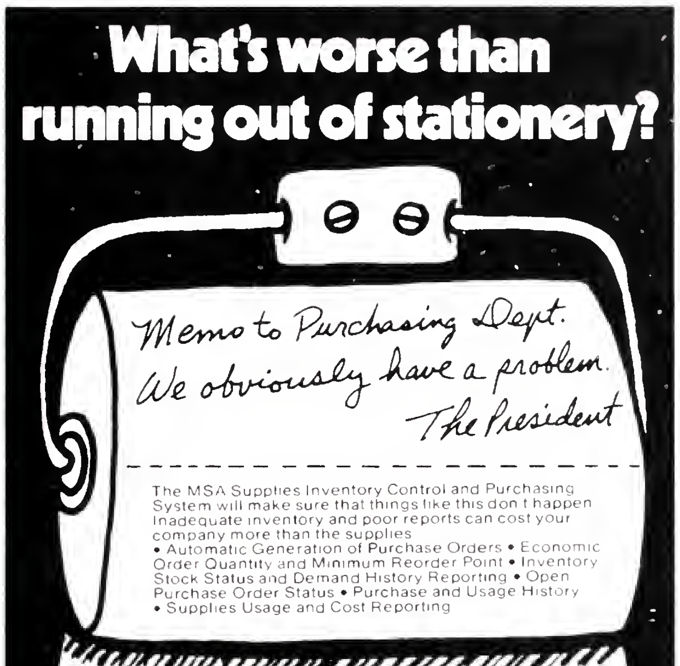
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CDC Net Climbs in Quarter, Six Months

MINNEAPOLIS – Control Data Corp.'s computer business earnings continued to climb in the second quarter and six months while earnings from Commercial Credit, its finance and insurance subsidiary, declined.

The firm's earnings reached $11.6 million or 67 cents a share in the quarter ended June 30 compared with a restated $9.3 million or 55 cents a share in the same quarter last year.

In the quarter, computer business earnings rose to $2.8 million from a loss of $601,000 in the same period last year, while Commercial Credit's earnings declined to $8.8 million from $9.9 million.

Computer business revenues climbed to $335.1 million compared with $299.4 million a year ago. Outright sales totaled $168.2 million compared with $135.2 million in the same period last year.

During the half year, CDC earned $21.7 million or $1.25 a share compared with $20.1 million or $1.20 a share in the year-ago period.

Of this, the computer business contributed $3.6 million compared with a $110,000 loss in the same period last year.

Commercial Credit's earnings dropped off to almost $18.1 million from $20.2 million.

Six-month computer business revenues reached $641.7 million compared with $581.4 million in the first half of last year. Sales totaled $314.9 million compared with $264.2 million in the same period last year.

Earnings of Commercial Credit in the second quarter were reduced by a $758,000 foreign exchange charge and by adverse claims and benefit costs in the insurance segment of the business, the firm said.

Burroughs Income Up 8.5%

DETROIT – Burroughs Corp.'s net income for the second quarter rose 8.5% to a record $42.5 million or $1.05 a share on revenues of $464.3 million.

Net income in the year-ago period was $39.1 million or 99 cents a share on revenues of $416.8 million.

Net earnings for the six-month period were $66.7 million or $1.66 a share, a 7% increase over the 1975 earnings of $62.5 million.

Estimated U.S. and foreign income taxes for the six-month period were $45.9 million, compared with $50.3 million in the year-ago period. The lower effective tax rate, due to foreign-exchange tax benefits, was responsible for much of the net income increase, according to a company spokesman.

Worldwide incoming orders in the first six-month period increased 22% over last year's first half, Ray W. Macdonald, chairman, said.

Burroughs views the remainder of 1976 and the year 1977 optimistically, Macdonald said, because of the outstanding customer acceptance of the newly released products, including the B4800/3800 medium to large systems and B80 small system.

Acquisitions

EG&G, Inc. has agreed in principal to acquire **Identicon, Inc.** Plans call for an exchange of 50,000 shares of EG&G common.

Automatic Data Processing, Inc. (ADP) has sold its publishing business, **Science & Medicine Publishing Co., Inc.**, to **Harcourt Brace Jovanovich, Inc.** for an undisclosed consideration. The unit had operated at a modest loss for the nine months ended March 31, ADP said.

Tymshare, Inc. has agreed in principle to acquire **Unitax, Inc.** for about 144,000 shares of common on the basis of one share for each four of Unitax common. Both firms supply computerized tax return services.

Vanier Graphics shareholders have approved plans for the merger of the firm with **American Business Products**, which is expected to be effective June 30.

Perkin-Elmer Corp. has completed its merger with **Wangco, Inc.** in an exchange of nine-tenths of a share of Perkin-Elmer common stock for each share of Wangco common.

Pertec Corp. has agreed to acquire **Icom, Inc.**, maker of microprocessor-based subsystems for microcomputers.

Western Union Corp. has acquired **Telstat Systems, Inc.** through a pooling-of-interests merger for a share-for-share exchange resulting in the issuance of about 875,000 shares of Western Union common stock. Telstat will become an operating division of the Western Union Teleprocessing Group.

Alanthus Corp. has acquired the **Leasco Data Communications Corp.** subsidiary of Reliance Group for $3 million cash and $1.25 million subordinated convertible notes.

System Development Corp. has acquired certain assets and contracts of **Moll Associates, Inc.**

Computer Usage Co. has acquired the **San Francisco Data Center** of Greyhound Computer Corp.

Tymshare, Inc. has agreed in principle to acquire **Simplified Data Processing Systems, Inc.** for 35,400 shares of Tymshare common stock.

Harris Corp. has acquired the **M&M Computer Industries, Inc.** division of The Singer Co. for an undisclosed amount of cash.

Automatic Data Processing, Inc. has acquired the brokerage services division of **PCS Data Processing, Inc.** and had also acquired **Information Sciences, Inc.**

Memorex Triples Earnings in Quarter

SANTA CLARA, Calif. – Memorex Corp. more than tripled its income before extraordinary credits in the second-quarter to $6 million or $1.04 a share.

This compared with income before extraordinary credits of $1.3 million or 28 cents a share in last year's second quarter.

Net income for the second quarter of 1976 was $9.1 million or $1.59 a share. This included an extraordinary credit of $3.1 million or 55 cents a share from utilizing tax loss carryforwards.

Revenues for the second quarter soared to $80.8 million, an increase of 23% over the comparable 1975 period.

Revenues for the first half also saw a sharp rise. They were reported at $160.2 million, an increase of 26% over revenues of $127.2 million for the first half of last year.

For the first six months of 1976, income before extraordinary credits was $11.3 million. An extraordinary credit of $6.9 million from utilizing tax loss carryforwards brought the net income to a total of $18.2 million.

For the similar period of 1975, income before extraordinary credits was $2.3 million, with credits from a loss carryforwards and debenture purchase totaling $5.4 million.

Itel Reports Record Six Months

SAN FRANCISCO – Itel Corp. reported record net income and revenues for its second quarter and six months, with second-quarter per-share income up nearly 100% from the comparable period.

For the second quarter, net income was $3.3 million or 50 cents a share, a 94% increase over 1975's second-quarter income of $1.7 million or 25 cents a share.

Revenues for the quarter were $63.3 million compared with $42.7 million a year ago.

For the six-month period, Itel reported net income of $6 million or 91 cents a share, a 58% increase over 1975's income of $3.8 million or 53 cents a share.

Revenues for the six months were $119.4 million, compared with $80.9 million for the first half of 1975.

...Toward the Bottom Line

Centronics Data Computer Corp. has declared a dividend of 15 cents a share payable Sept. 6 to holders of record Aug. 6. This represents a 50% increase over the previous quarterly dividend.

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DPF has signed a $30 million revolving credit and term loan agreement with four banks led by the First National Bank of Boston.

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Computer Optics has signed a lease financing agreement with North American Corp. providing for the purchase of up to $5 million in terminal systems.

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T-Bar, Inc. has arranged a $1 million loan from the Prudential Insurance Co., to retire existing debt and for use as working capital.

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Technology Management, Inc., a financial consulting and systems development firm, has changed its name to TMI Systems Corp.

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LRC, Inc. has finalized a $1 million expansion of its debt resources with the placement of an aggregate of $500,000 of subordinated debentures to Central Investment Corp., MorAmerica Capital Corp. and Electro-science Growth Investments.

$$$

National CSS, Inc. has completed a $3.8 million medium-term debt financing with Northwester National Life Insurance Co. The proceeds are being used to finance a portion of the purchase price of an Amdahl Corp. 470/V6 acquired in June.

$$$

IBM has announced a third-quarter dividend of $2.25 a share, payable Sept. 10 to holders of record Aug. 11. This represents a 50 cent increase over the last dividend.

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DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 508 Robert E. Lee Bldg. Jackson, MS, 39202, up until 2:00 p.m. 8-23-76 for the following data processing equipment:

Request for Proposal No. 257 for the lease or purchase of a remote batch terminal capable of communicating with a Univac 1106 system.

Request for Proposal No. 258 for the lease or purchase of a marksense input device capable of communicating with an IBM 370 Model 155 over telephone facilities.

Request for Proposal No. 259 for the lease or purchase of a minicomputer and floppy disk system to be used to monitor and record results of psychology lab experiments.

Detailed specifications may be obtained from the CDPA office. The CDPA reserves the right to reject any and all bids and proposals and to waive informalities. Clyde P. Ballard, Executive Director, Central Data Processing Authority.

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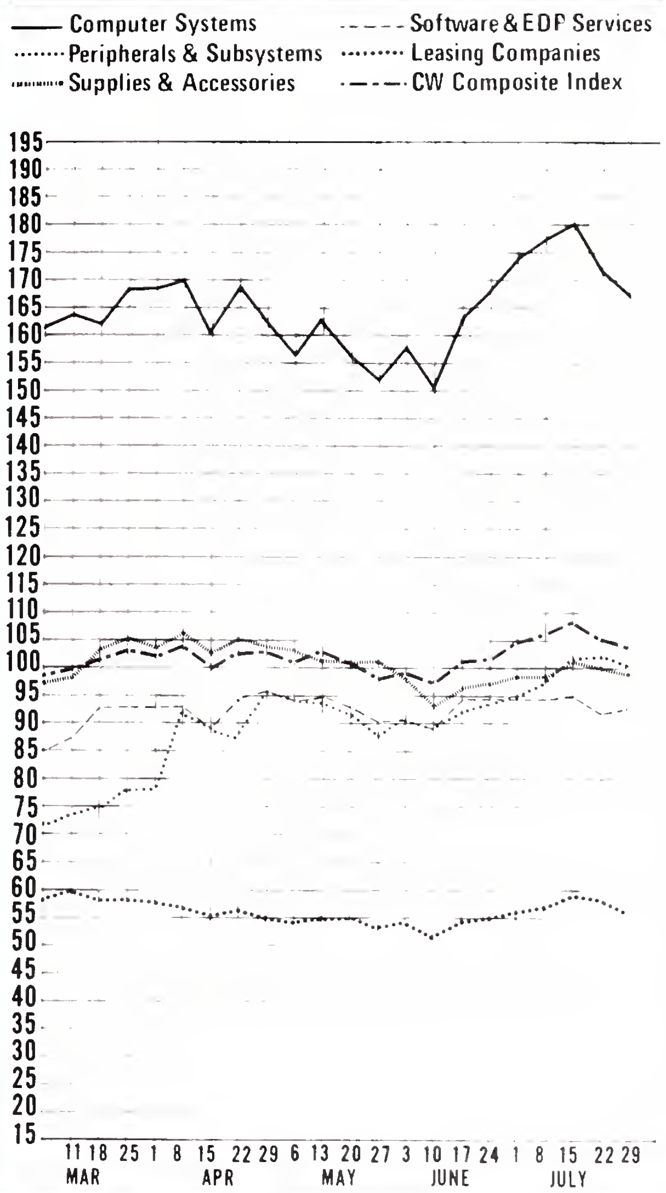

Earnings Reports

ELECTRONIC TABULATING

Three Months Ended March 31

	1976	1975
Shr Ernd	$.24	$.16
Revenue	839,458	751,287
Earnings	102,896	65,923

KEANE ASSOCIATES

Three Months Ended March 31

	1976	1975
Shr Ernd	$.06	$.06
Revenue	1,278,000	1,135,000
Earnings	48,000	52,000

LEWIS BUSINESS FORMS

Three Months Ended Jan. 31

	1976	1975
Shr Ernd	$.21	a$.36
Revenue	7,674,000	9,039,000
Earnings	301,000	517,000

a-Adjusted to reflect five-for-four stock split on April 30, 1975.

MANUFACTURING DATA SYSTEMS

Three Months Ended Feb. 29

	1976	1975
Shr Ernd	$.15	$.13
Revenue	3,655,000	2,784,000
Earnings	377,000	285,000
6 Mo Shr	.29	.20
Revenue	7,251,000	5,181,000
Earnings	735,000	444,000

ADDRESSOGRAPH-MULTIGRAPH

Three Months Ended April 30

	1976	a1975
Shr Ernd	$.26	$.12
Revenue	146,580,000	145,989,000
Earnings	2,088,000	978,000
9 Mo Shr	.45	.34
Revenue	415,294,000	429,195,000
Earnings	3,650,000	2,760,000

aRestated to reflect change in accounting method for foreign currency translations.

ANALOG DEVICES

Three Months Ended May 1

	1976	1975
Shr Ernd	$.30	a$.23
Revenue	9,755,023	7,456,278
Earnings	474,858	346,593
6 Mo Shr	.56	a.40
Revenue	18,323,438	14,745,310
Earnings	878,293	592,989

a-Adjusted to reflect 5% stock dividend in March 1976.

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TRADE•QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, JULY 28, 1976

All statistics compiled, computed and formatted by
TRADE★QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE			
		1976 RANGE (1)	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	BUPPOUGHS CORP	84-108	95 3/4	-5 1/2	-5.4
O	CCMPUTER AUTOMATION	10- 19	16 1/4	- 5/8	-3.7
N	CONTROL DATA CORP	18- 27	23 1/8	- 3/4	-3.1
N	DATA GENERAL CORP	40- 60	51 1/4	-1 3/4	-3.3
O	DATAPCINT CORP	24- 46	38	-4	-9.5
O	DIGITAL COMP CONTPOL	2- 7	6	- 1/2	-7.6
N	DIGITAL EQUIPMENT	138-181	170	-1 1/4	-0.7
N	ELECTRONIC ASSOC.	2- 5	2 7/8	- 1/8	-4.1
A	ELECTRONIC ENGINEEP.	7- 16	9 3/4	+ 1/8	+1.2
N	FOXBORO	28- 46	43 3/4	+ 3/8	+0.8
O	GENEPAL AUTOMATION	5- 11	6 3/8	+ 1/8	+2.0
O	GRI CGMPUTER CORP	1- 1	5/8	0	0.0
N	HEWLETT-PACKARD CO	95-117	109	+1 1/4	+1.1
N	HONEYWELL INC	34- 56	47 3/8	-1 1/4	-2.5
N	IBM	227-280	273	+2	+0.7
O	MANAGEMENT ASSIST	1- 3	2 1/8	- 1/8	-5.4
O	MEMOREX	18- 33	26 1/2	- 5/8	-2.3
O	MICPODATA CORP	10- 27	24	+ 1/4	+1.0
O	MODULAR COMPUTEP SYS	9- 14	11 1/4	0	0.0
N	NCR	24- 36	33 1/8	- 1/8	-0.3
O	PRIME CCMPUTER INC	4- 14	14	+1 1/2	+12.0
N	PEPKIN-ELMEP	19- 27	22 1/8	-1 1/8	-4.8
N	RAYTHEON CO	45- 66	60 1/2	-2 1/4	-3.5
N	SPERRY RAND	40- 52	46 3/4	-1 1/2	-3.1
O	SYCOP INC	20- 31	23	- 3/4	-3.1
A	SYSTEMS ENG. LABS	6- 10	8 1/2	- 1/2	-5.5
N	VARIAN ASSOCIATES	13- 17	14 1/2	- 1/2	-3.3
A	WANG LABS.	11- 20	15 1/2	- 5/8	-3.8

LEASING COMPANIES

EXCH		1976 RANGE (1)	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	CCMDISCO INC	3- 10	7 1/4	- 1/4	-3.3
A	CCMMERCE GPOUP COPP	2- 3	2 7/8	- 1/8	-4.1
A	COMPUTER INVSTRS GPP	1- 3	1 3/4	+ 1/8	+7.6
M	DATPONIC RENTAL	1- 1	1 1/8	0	0.0
A	DCL INC	1- 1	5/8	-	-9.1
N	DPF INC	5- 8	7 1/8	- 3/8	-5.0
A	GREYHOUND COMPUTEP	3- 8	7 1/4	- 1/8	-1.6
N	ITEL	6- 15	13 5/8	- 1/8	-0.9
N	LEASCO CORP	6- 19	15 1/2	+ 3/4	+5.0
O	LEASPAC COPP	0- 1	1/4	0	0.0
O	NRG INC	0- 1	1/2	0	0.0
A	PICNEER TEX CORP	6- 9	7 3/8	- 3/8	-4.8
N	U.S. LEASING	7- 12	10 1/4	- 1/8	-1.2

SOFTWARE & EDP SERVICES

EXCH		1976 RANGE (1)	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ACVANCED COMP TECH	1- 2	1 3/8	0	0.0
O	ANACOMP INC	8- 11	8 3/8	- 1/2	-5.6
A	APPLIED DATA RES.	2- 4	3 3/4	+ 1/8	+3.4
N	AUTCMATIC DATA PPOC	17- 35	33	- 1/8	-0.3
O	COLEMAN AMERICAN COS	3- 6	3	0	0.0
O	CGMPUTER DIMENSIONS	3- 7	5 1/4	+1 1/4	+31.2
O	CCMP ELECTION SYSTMS	5- 9	6 1/2	- 1/2	-7.1
O	COMPUTEP HGRIZONS	1- 2	2	0	0.0
O	CCMPUTER NETWORK	2- 6	3 1/4	- 1/8	-3.7
N	COMPUTER SCIENCES	4- 8	6 5/8	- 1/4	-3.6
O	CCMPUTER TASK GROUP	1- 1	1 5/8	+ 1/2	+44.4
O	COMPUTER USAGE	3- 6	2 7/8	- 3/8	-11.5
O	COMSHAPE	2- 9	7 1/2	- 1/2	-6.2
O	CATA DIMENSICNS INC	2- 4	3	0	0.0
O	DATATAB	1- 1	7/8	- 1/8	-12.5
N	ELECTPCNIC CATA SYS.	12- 16	13 1/8	- 3/8	-2.7
O	INFONATICNAL INC	1- 1	1/8	0	0.0
O	INSYTE CORP	1- 3	1 3/4	+ 1/8	+7.6
O	IPS COMPUTER MARKET.	1- 2	1 3/8	+ 1/4	+22.2
O	KEANE ASSOCIATES	2- 4	3 3/8	0	0.0
O	KEYDATA CORP	3- 5	2 1/2	0	0.0
O	LGGICON	4- 4	3 1/2	0	0.0
A	MANAGEMENT DATA	1- 3	2 1/4	+ 1/4	+12.5
A	NATIONAL CSS INC	13- 25	21 3/4	0	0.0
A	ON LINE SYSTEMS INC	18- 22	18 5/8	- 1/4	-1.3
N	PLANNING RESEARCH	3- 5	3 3/4	0	0.0
O	PRCGRAMMING & SYS	1- 1	3/8	0	0.0
O	RAPIDATA INC	2- 5	2	- 1/2	-20.0
O	REYNOLDS & REYNOLD	13- 21	17 3/4	+ 1/2	+2.8
O	SCIENTIFIC CGMPUTERS	1- 1	1/2	0	0.0
O	TYMSHAPE INC	19- 28	25 3/8	- 1/8	-0.4
A	URS SYSTEMS	3- 5	4	+ 1/4	+6.6
N	WYLY CORP	2- 7	2 3/4	- 1/4	-8.3

PERIPHERALS & SUBSYSTEMS

EXCH		1976 RANGE (1)	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDPESSOGRAPH-MULT	8- 13	9 3/4	- 5/8	-6.0
O	ADVANCED MEMORY SYS	4- 10	7 7/8	- 3/8	-4.5
N	AMPEX COPP	5- 10	8 5/8	- 5/8	-6.7
O	ANDEPSCN JACOBSON	2- 4	2 3/4	0	0.0
O	APPLIED DIG DATA SYS	13- 25	22 1/4	-1 1/4	-5.3
O	BEEHIVE MEDICAL ELEC	3- 9	8 1/8	- 5/8	-7.1
A	BOLT,BEPANEK & NEW	7- 11	9 1/2	- 1/8	-1.2
N	BUNKER-RAMO	5- 10	8 7/8	- 1/8	-1.3
A	CALCCMP	4- 7	5 3/8	- 1/4	-4.4
O	CAMBRIDGE MEMOPIES	0- 6	3/8	-1	-72.7
N	CENTPCNICS DATA COMP	20- 36	31 3/8	-1 3/4	-5.2
O	CODEX CORP	22- 42	32	0	0.0
O	CCGNITPONICS	1- 1	7/8	0	0.0
O	COMPUTEP COMMUN.	1- 5	4 1/2	+ 3/4	+20.0
O	CCMPUTER CCNSOLES	4- 7	5 3/4	0	0.0
A	COMPUTER EQUIPMENT	1- 3	1 5/8	- 1/8	-7.1
O	COMPUTER TRANSCEIVER	1- 3	1	- 1/4	-20.0
O	CCMTEN	4- 9	8	- 1/2	-5.8
N	CCNRAC COPP	20- 25	23 3/4	0	0.0
O	DATA ACCESS SYSTEMS	1- 4	3 1/4	0	0.0
O	CATA 100	7- 13	8 1/8	- 5/8	-7.1
A	DATA PRODUCTS CORP	5- 14	13	0	0.0
O	DATA TECHNOLOGY	1- 2	1 1/2	0	0.0
O	DATUM INC	1- 2	1 3/4	- 1/4	-12.5
O	DECISION DATA COMPUT	1- 4	2	+ 1/8	+6.6
O	DELTA DATA SYSTEMS	1- 1	1	+ 1/8	+14.2
N	ELECTRCNIC M & M	1- 3	3	0	0.0
O	FABRI-TEK	1- 1	3/4	+ 1/8	+20.0
O	GENERAL CCMPUTER SYS	1- 2	1	0	0.0
N	HAZELTINE CORP	4- 12	9 1/2	+ 1/8	+1.3
N	HARRIS CORP	34- 52	51	- 1/4	-0.4
A	INCOTERM CORP	9- 20	10 1/8	-1 5/8	-13.8
O	INFOREX INC	3- 7	3 7/8	0	0.0
O	INFORMATICN INTL INC	10- 18	11 3/8	-1 1/2	-11.6
O	INTEL CORP	60-109	63	-4	-5.9
A	LUNDY ELECTRONICS	4- 7	4 3/8	- 1/4	-5.4
O	MSI DATA CORP	3- 7	6 7/8	0	0.0
A	MILGO ELECTRONICS	15- 21	18 1/2	0	0.0
N	MOHAWK DATA SCI	3- 9	7 7/8	- 1/2	-5.9
O	PENRIL CORP	1- 3	1 7/8	- 1/8	-6.2
A	PERTEC CORP	3- 8	5 3/4	- 1/4	-4.1
A	POTTEP INSTRUMENT	2- 2	1 3/4	0	0.0
O	PRECISION INST.	7- 10	5	0	0.0
O	QUANTOP CORP	4- 6	5	- 1/4	-4.7
O	RECCGNITION EQUIP	6- 11	8 5/8	+ 1/8	+1.4
N	SANDERS ASSOCIATES	6- 11	9 5/8	- 1/8	-1.2
O	SCAN DATA	2- 4	2 1/4	- 1/8	-5.2
O	STORAGE TECHNOLOGY	9- 13	11 7/8	- 5/8	-5.0
O	T BAR INC	5- 10	5 3/4	- 1/4	-4.1
O	TALLY CORP.	4- 6	4 3/4	- 1/2	-9.5
O	TEC INC	3- 5	3 3/4	+ 1/4	+7.1
N	TEKTRCNIX INC	45- 67	56 1/4	0	0.0
N	TELEX	2- 5	3 5/8	0	0.0
O	WANGCO INC	11- 22	21 1/8	- 1/8	-0.5
O	WILTEK INC	2- 2	2 7/8	+ 1/8	+4.5

SUPPLIES & ACCESSORIES

EXCH		1976 RANGE (1)	CLOSE JUL 28 1976	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCED SYSTEMS INC	1- 4	3 1/4	0	0.0
O	BALTIMORE BUS FORMS	4- 5	3 1/2	0	0.0
A	BARRY WRIGHT	6- 10	8	+ 1/4	+3.2
O	CYBERMATICS INC	1- 1	5/8	0	0.0
A	DATA DOCUMENTS	30- 42	30	-1	-3.2
O	DUPLEX PRODUCTS INC	15- 24	15	+ 1/2	+3.4
N	ENNIS BUS. FORMS	6- 9	6 3/8	- 3/8	-5.5
O	GRAHAM MAGNETICS	8- 13	9	0	0.0
O	GRAPHIC CONTROLS	13- 19	14 1/2	- 1/4	-1.6
N	3M COMPANY	53- 65	59 7/8	+1 3/8	+2.3
O	MCORE CORP LTD	40- 51	40 1/2	-1 3/4	-4.1
N	NASHUA CORP	11- 17	16 1/4	+ 1/8	+0.7
O	STANDARD REGISTER	15- 19	15 1/2	+ 1/4	+1.6
O	TAB PRODUCTS CO	5- 11	10	- 1/2	-4.7
N	UARCO	21- 25	21 1/2	0	0.0
A	WABASH MAGNETICS	4- 8	7 1/2	0	0.0
N	WALLACE BUS FORMS	19- 25	20 1/4	- 1/4	-1.2

EXCH: N=NEW YORK; A=AMEPICAN; P=PHIL-BALT-WASH
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